The Dental Digest.

Vol. XIII. CHICAGO, FEBRUARY, 1907. No. 2.

Original Contributions.

THE NECESSITY FOR REFORM IN DENTAL EDUCATION.

BY D. D. SMITH, D.D.S., M.D., PHILADELPHIA, PA. READ BEFORE THE MICHIGAN STATE DENTAL ASSOCIATION, AT DETROIT, JULY 12, 1906.

You will pardon me if on this occasion I omit the stereotyped, adulatory exordium which is so commonly employed to set forth the achievements and wonderful advancement (?) of the dental profession in the past twenty-five or thirty years, and allow me, from my own standpoint, to present a view of dental conditions as I find them to-day. To secure this picture I have pushed the dental camera a little closer to the object, readjusted some of the shade screens and brought the whole into a different, if not more perfect, light. My effort has been to focus attention more sharply upon some objects hitherto disregarded, perhaps unnoticed, in the field of dentistry.

Possibly you will be disappointed that I come to you with so little of compliment as to the present standing of the profession we represent, but I am not here in the spirit of the pessimist; on the contrary, I am an optimist and believe that the dental profession one day will stand before the world as the coadjutor of medicine, a real adjunct to the mother science, and something more helpful to humanity than any present recognized branch of medicine.

Necessity for the existence of the dental profession is paramount. We occupy a field in human need unexplored and untouched by any other science. It is within the province of dentistry to contribute untold benefit to the comfort and well-being of humanity, and not to create or foster pathological conditions which perpetuate them-

selves, as inexcusable ignorance may allege. These facts are without proper recognition solely because dentistry has failed to extend its confines and occupy its legitimate field of service.

Edward C. Kirk, D.D.S., Sc.D., of the Dental Department of the University of Pennsylvania, in an editorial of a comparatively recent issue of the *Dental Cosmos,* has taken the profession severely to task for its perpetual revolution around what he calls "The Same Old Thing." He practically charges that the profession is made up of a lot of ignoramuses, deficient in orthography and good English, and who evolve "nothing new in dentistry." What new things can dentistry evolve, what new thing can it bring forth while its teachers dwell mainly upon and extol the filling of a hole in a tooth, the setting of a crown, or the construction of a dental bridge?

Dr. Horatio C. Wood, a most eminent professor in the same university, with great candor and the utmost boldness, has publicly declared the degree of D.D.S. to be "a badge of partial culture."

Professor Truman, editor of the late *International Dental Journal,* regaled us, not long since, with an editorial on the state of the profession, in which he says: "We are floating in shallow waters; it would seem that we have not been doing all that is possible to meet changing conditions. It is quite evident that all this means for dental colleges a more stringent method, if not a new standard of training."

If the profession is revolving around "the same old thing," if it is "floating in shallow waters," if its degree is but "the badge of partial culture," and this seems to be the consensus of opinion of the faculty of one of the leading institutions of the country, there must be something at fault somewhere. Is that fault discernible?

Dentistry is, or ought to be, the custodian of all the complex offices and conditions pertaining to the human mouth, and the human mouth is the very vestibule of human life; but dental teachers, dental writers and dental practitioners, seemingly of their own volition, have so circumscribed and limited the scope of dentistry, that it stands to-day for scarcely more—surely nothing higher—than the redemption of decayed teeth.

Have our schools of dentistry or our representative practitioners impressed the medical profession or the public generally with the thought that dentistry represents anything beyond the care of the teeth? Is it not true that in many cases, even extraction of these

organs, the only operation approaching a surgical operation, as dentistry is now taught, is supervised by a medical attendant?

Let us here glance at what we stand for in the eyes of the outside world. Webster's Unabridged Dictionary defines dentist as "one who makes it his business to clean, extract and repair natural teeth, and to insert artificial ones." The Century, that latest and supposedly most up-to-date standard in definition, defines dentist as "one whose profession it is to clean and extract teeth, repair them when diseased, and replace them when necessary by artificial ones; a dental surgeon."

Stripped of all embellishment and in cold type, these settings for the dentist and dentistry are not calculated to engender pride in our profession, or to make the dentist overly puffed up with the dignity of his calling.

Looking to the future, however, we may take comfort in the thought that in its true meaning, dentistry will yet be a most important auxiliary to general medicine, and when it shall truly come into its own, it will be esteemed, we believe, as the most important branch of the healing art.

The service of dentistry will yet be recognized as a service to humanity greater than that of any present auxiliary of medicine. Why is it, then, that we are persistently revolving around "the same old thing," that we are "floating in shallow water," that our degree is esteemed but "the badge of a partial culture?" What is wanting? Where does the fault lie? Is it not to a great extent in our methods of education?

No observer of present conditions will challenge the statement that already there are a sufficient number of colleges in this country granting the degree of dentistry; certainly there are quite enough to meet all present, or any immediate prospective requirements of the system of education at present in vogue.

The first dental college was instituted in Baltimore in the year 1839. The second, the Ohio Dental College, Cincinnati, was established in 1843. The third, the Pennsylvania College of Dental Surgery, came into existence in 1846. Since that time there have sprung up in various parts of the country from fifty to sixty similar institutions, and others are being added every year.

These institutions being equipped with an average of ten professors and minor teachers in each, are usually designated as "col-

leges." The word "college" varies in signification in different countries. In Scotland, the United States and in Canada, it is understood to mean, "an incorporated institution of learning of the highest grade."

If "college" means an institution of learning, even though the greatest latitude be granted the definitions, is it not strictly within bounds to say that few, possibly none, of our dental colleges are really entitled to the appellation? Can it be justly claimed that any of the fifty or more of our dental colleges have an equipment for teaching that should entitle them to recognition as institutions of learning?

Do the D.D.S., the D.M.D. or the Canadian L.D.S. under the present regime mark any degree of literary culture? Does any one of them denote any special attainment in any one of the sciences? Does any one of them carry with it any practical knowledge of either medicine or surgery? Can any one of them be said to be a badge of equipment for the practice of anything but the *mechanics* of dentistry?

Comparing the degree of dentistry with that of medicine, it will be found that they occupy widely divergent standings in the community: they are widely divergent in the attributes of authority and privilege. They are also regarded as far separated in educational culture.

There is not a question of diagnosis, treatment or general management, even in a purely dental case, where, if difference of opinion should arise, the dictum of the medical man would not be regarded as authoritative over that of the dentist. The M.D. is broad in the scope of its authority, and carries with it the right to practice in all fields. The D.D.S. confers no right of practice beyond the confines of simple dentistry. It does not permit of the signing of a death certificate, although death should result from causes which are strictly within the field of dental operations.

Who is so bold as to deny that dentistry as represented by our schools and as practiced to-day, is not narrowed and circumscribed, even in its own recognized province?

Dental teachings in text books and periodical literature, instead of expanding the sphere of dentistry have narrowed it until it nowhere means much beyond the treatment of the one condition—caries of the teeth and its consequences.

Does not dentistry stand with folded hands and bated breath in the presence of the more serious troubles affecting the teeth themselves? Does it not acknowledge inability both in diagnosis and in the treatment of many baleful states of the human mouth, and conditions destructive of human teeth?

Foreign countries that a few years ago welcomed American dentists, are now practically barring out graduates who have only the dental degree from American institutions. I am aware that it may be claimed that this is a matter of jealousy, or a selfish desire on the part of foreigners to stop American practitioners in foreign fields; but this explanation scarcely will satisfy observers who note the grade of scholarship and the advanced scientific work of some foreign institutions over American ones, and this, notwithstanding that they may note how inferior to Americans the majority of foreign operators are in their practical manipulations.

German endeavor is certainly leading American dentistry in experimental investigation and inquiry concerning the mouths of children in public schools. While compulsory inspection is by no means universal, efforts are being made in that direction, and plans for the betterment of mouth conditions are being considered. English medical diagnosis also, far in advance of American diagnosis, has discovered untoward conditions of the mouth as causes of systemic disease. It is along these lines that true oral prophylaxis will find its most perfect demonstration.

Since the unfolding of the great benefits of the oral prophylaxis treatment, perhaps a hundred patients have said in effect, "Your medical course helped you greatly, I suppose, in the development of this matter." On the contrary, in my medical course of two years (one year was credited to me for being a graduate in dentistry), I heard not one respectful allusion to dentistry, either as a special profession, or as a coordinate branch of medicine.

The study of medicine greatly enlarged the horizon of my vision. It brought more prominently into view the grandeur of the science and its great benefits to humanity. It shed new light upon its wonderful discoveries. It unfolded the self-sacrificing labor and toil of individual members of that profession for the good of mankind. It filled me with new aspirations and new desires. It also uncovered as never before the fact that medicine has its limitations. While it furnished no more extended insight into dentistry proper, it revealed

the fact that medicine at its best is wholly ignorant of dental conditions and dental possibilities. It taught me that medicine is as totally devoid of knowledge of dentistry as dentistry is of medicine.

To the dentist becoming a student of medicine, the lack of homogeneity in teachings and practice is painfully apparent. The distinction appears as an impassable chasm; or one which can be bridged only by a better understanding and more consistent teachings on the part of both professions.

As an illustration of the want of apprehension of dentistry, or so-called dental surgery, by medical men, let me mention that one of the most distinguished surgeons of his day at one of his clinics, called me into the operating arena to extract a partially imbedded right lower wisdom tooth, and presented me with a pair of straight superior incisor forceps with which to perform the operation. So far as I have been able to observe, this is a fair illustration of the attention given by surgeons and medical men to dentistry or mouth conditions.

Let me here present this prophecy: educated dentistry will yet demonstrate its power to aid medicine with an emphasis which shall gain for it not only recognition, but full respect and admiration.

There are innumerable claims and assertions to the effect that dentistry is at present a branch or department of medicine. Such claims are wholly without substantiation; there is no practice in dentistry to show it.

"Father," said a thoughtful little boy, "how many feet has a dog if we call his tail his foot?" "Why, five feet, my son." "No father, that isn't right." "Why isn't it right?" "Why, you see, calling his tail a foot doesn't make it a foot."

No more does affirming dentistry to be a branch of medicine, make it a branch of medicine. Unpalatable as it may be to our pride, the fact remains—dentistry, as at present taught in our schools, is essentially a system of mechanics.

As a stream cannot rise above its fountain head, no more can a profession rise above the level of its educational institutions. The present methods of dentistry are distinctly an outgrowth of inadequate conceptions. Courses of dental instruction are not unlike the experience of a youth, wandering along a field footpath, who came upon a large stone inscribed on the upper side with the words "turn me over," and who, after much difficulty, finally succeeded in turn-

ing the stone over, only to find on the other side, "now turn me back again, so that I can fool some other idiot."

Phillips Brooks once said: "There are two elements in the making of every perfect work—a perfect pattern and a perfect workman." For very good reasons a perfect pattern for our profession has not yet come into view. The perfect teacher is perhaps too modest to announce himself.

There have not been in the past, nor are there in the present, adequate facilities for the preparation to teach the science of dentistry. Of necessity, the important offices of instructors have to be recruited from the rank and file of existing conditions; and the D.D.S. has furnished the larger quota. There are "professors" in our schools to-day flaunting only the D.D.S., who are so puffed up with foolish conceit and self-importance, that they refuse to avail themselves of many opportunities for acquiring a knowledge of better methods and a broader culture.

Is not investigation looking to prevention better than being forever occupied in mechanical repair?

Listen to the song of Dr. A. G. Bennett, in the *Dental Digest*, July, 1902:

THE TRUE DEPARTURE.

"The merest mention of prevention
Brings out the true ideal,
And each resource and all our force
Combine to make it real.
Like the strenuous life with vigor rife,
With virile force abounding,
It has no need of any creed,
It does its own expounding."

To be successful in bringing students to an institution, it is assumed that the *mechanics* of dentistry must be taught principally; and thus it has come to pass that the "operator," the mechanic, frequently, with scant regard to merit or literary qualifications, has assumed the place of the teacher.

It was common report at the meeting of the National Dental Association at Asheville, N. C., in 1903, that a dean representing the dental department of one of our leading universities was censured and fined in the Faculties Association for violation of rules adopted for the matriculation of students. We may guess the reason

why matriculates in dentistry very frequently do not measure up to even the low educational standard adopted by the Faculties Association.

It cannot be successfully disputed that the mechanics and mechanisms of dentistry are the dominating factors in the judging of the qualifications of a student or practitioner. If he can fill teeth, if he can make a plate, if he can adapt artificial teeth in place of natural ones; in later time if he be adjudged a competent inlay, crown and bridge worker, deficiencies in scholarship in general science and in ethical culture are condoned or even entirely waived.

Must the service of dentistry forever remain the mechanical routine of crowding gold, amalgam or porcelain into cavities of decay? Must it ever be that the goal of our dental schools is to be the goal of numbers rather than that of education and usefulness?

Have dental departments in medical colleges and universities, from which, at their institution, so much of good was expected, improved the educational status of dentistry? Not markedly, if at all. If it should be urged that medical colleges have thereby at least *recognized* dentistry, with equal force, the same may be said of their attitude toward "veterinary surgery." The University of Pennsylvania in 1903, after joining with other colleges in a compact to advance the standard of dental education by lengthening the course of study, later made public announcement through its dean, Dr. Kirk, receding most ingloriously from the arrangements because, forsooth, Harvard refused to lengthen its course. It seems plain that dental departments—addenda to universities as at present maintained—are expected, first of all, to "draw" students.

If it ever was believed or expected that medical colleges or universities would make the department of dentistry the equal of the medical department in culture and training, that expectation has not been met. Even in the branches taught and studied in common, as chemistry, anatomy and surgery, there is good reason to believe that in most of these schools the dental student neither is required nor expected to be the equal of the student of medicine; and it would be difficult to conceive of the dental professor as on a plane equal in influence and importance with that of the medical professor.

It is within my own and your remembrance that a medical faculty established a dental department and elected a dean who made his debut before the National Dental Association as the representative of

his college, with a paper entitled "Dies and Counter-Dies!!" Can the true devotee of dentistry contemplate such conditions with much satisfaction or hope?

Patrick Henry once said: "There is no way of judging the future but by the past." If this be true in educational as in political matters, it must be admitted that there is no great encouragement to hope that in the near future there will be substantial elevation or gain in *matter* or *methods* in dental colleges.

With no intention or desire to detract from the importance of the practical application of mechanics in dentistry, we maintain that if the profession shall ever reach a higher plane and take its rightful place as a branch of medicine, there must be recognition of the vital necessity for a higher standard of scholarship and a broadening of the curriculum in every dental college and in every dental department of the medical colleges.

The filling of cavities in teeth, whether with metals, cements or porcelain, must be subordinated to the study of conditions governing the *preservation* of teeth. The prevention of decay must be forced upon a level, higher than the mechanics of "extension for prevention." Overcoming and eradicating infection in the human mouth must be adjudged more important and more to be desired than dental inlays, crowns or bridges. The *prevention* of diseased conditions must be esteemed greater than the cure of disease. The complex conditions and relations of the oral cavity must be studied and treated as the natural and rightful heritage of dentistry. Last, but not least, teachers must be prepared and competent to teach dentistry as a science; even as a department of medicine. Along these lines rather than in lengthening the general course of study, or in higher standards for admission, or in reaching after brighter students, we may confidently look for better things in dentistry.

There also must be reform amounting to revolution in the textual matter of dentistry. This is now so completely given up to the mechanics of dentistry, that neither the dental text-books, our periodical literature, nor the didactic lecture offers much of benefit beyond the mechanics of filling teeth.

The present literature of dentistry exhibits nothing in common with the science of medicine or its teachings. Take the following as an example: In the latest text-book on operative dentistry, the first chapter, consisting of twenty-six pages, is devoted to a descrip-

tion of the physical characteristics of the teeth. Two short paragraphs are given to "definition" and "function"; and the whole of the remainder of the twenty-six pages of the chapter to "mechanical design," of which the following is an extract:

"The Lower Molars":—The first lower molar approximates the second lower bicuspid on its distal side. It is the first of the two grinders of the lower jaw, and the largest tooth in the dental series. Unlike the upper molars the transverse diameter is less than the mesio-distal. The greater breadth is found across the base of the disto-buccal tubercle. The crown is square or trapezoidal in form, depending on the size of the fifth tubercle. Being quinquituberculate, the crown is broadened by the multi-cuspid grinding face. The buccal face is inclined toward the center of the tooth for its morsal half to accommodate the occluding teeth. Architecturally, the tooth is formed of four cones and may be roughly divided into four quarters. There are four primitive cones with their tubercles and one cingule in the structure. The morsal surface (b) is trapezoidal in outline, the buccal line being the longest. The buccal angles are acute, while the lingual are rounded and obtuse. There are five tubercles, two on the lingual margin and three on the buccal. They are named the mesio-buccal, median buccal, disto-buccal, disto-lingual and mesio-lingual. These tubercles are less obtuse and more rounded than those of the other grinding teeth, mesio-buccal usually being the largest; the others are not so prominent, rarely raised and sharp. The ridges are: the marginal ridges, buccal, distal, lingual, and mesial, and the five triangular ridges descending from the five tubercles toward the center of the tooth." And so on and on for the balance of the twenty-six pages—not one whit more readable, instructive or important.

To gain a better idea of this text book, I may be permitted to quote from a critic of the work who dared to read it with impartial eyes. He says: "The mechanical make-up of this book is a credit to the publishers; the paper being good, the type large and plain and the illustrations well defined. That a number of the more important of the illustrations have been made to suit the fancy of the writer and are untrue to nature is not the fault of the publishers. In construction the work is after the plan of the 'American System of Dentistry,' published by the same house in 1893, there being fifteen different writers for the twenty-three chapters or subjects

treated. While something can be said in commendation of the work, it may be questioned whether collaboration in authorship is a special gain. The plan involves overlapping of subjects, repetition of matter and considerable diversity in methods of teaching, all of which is confusing to the beginner and of doubtful utility to the practitioner. These defects, however, are not so pronounced in this work as in the 'American System.'

"The authorship of 'The American Text-Book of Operative Dentistry' should warrant the statement that it embodies the latest and best in dental science, not only in discovery and practice, but in teaching also.

"As the claim that dentistry is a branch of medicine is sharply made in some quarters, we have examined this book with unusual interest, and great care, to determine whether this kinship, this link connecting the two professions could be discovered through this composite production of this body of dental writers.

"We have to confess that the claim seems wholly unsubstantiated in this, as it is in previous works upon dentistry. It is mechanics, mechanical manipulation and mechanical appliances that receive the consideration of every author, and are persistently at the front throughout this whole work. The opening subject of one of the principal writers is 'The Operator,' and the first sentence this: 'The attitude of the body of the dental operator has considerable influence upon the ease with which the various positions required in operating may be assumed, and also has some bearing upon the freedom of the hands.'

"Omitting here much equally obvious detail, we come upon the highly entertaining sentence, 'The contact with the patient should be at as few points as possible, and should generally be made with the fingers.' (Is this intended to advise the operator against the inadvertent use of the toes?) Another, a professor and dean, the man who so thoughtfully (?) warned the profession against oral prophylaxis lest the use of pulverized pumice and an orange-wood point, used once a month, should irreparably wear away the enamel of the teeth, begins his subject, 'The importance of the proper preparation of a cavity for the insertion of a filling can scarcely be overestimated.' We may, with great propriety, ask ourselves here, is this the best that dentistry has to present to students of the

science? If so, let us no longer boast of it as a *profession*, much less as a part of the medical profession.

"As if more fully to accentuate the mechanics of operative dentistry and perhaps to give prominence to special friends, instruments and appliances which have never found favor with dentists and are now obsolete, are illustrated and minutely described, while the great fields of etiology and prophylaxis are left practically untouched.

"In the chapter on 'Pyorrhea Alveolaris' following a succinct treatise on the history of this disorder, there is an apparent determination to circumscribe it within the bounds of certain papers which appeared in the *Cosmos* between 1892 and 1895, wherein this trouble was presented as a local manifestation of the gouty diathesis —constitutional.

"To support this theory important manifestations and facts have been overlooked or ignored, as have also some recent valuable contributions to the literature of the subject. Enough has long since been demonstrated respecting the etiology and treatment of alveolar pyorrhea to relegate such absurdities to the rubbish heap, instead of giving them place in dental text-books to mislead students and retard investigation.

"Under 'Discolored Teeth and Their Treatment' the editor discourses upon discoloration in general with remarkable scientific acrobatism, but omits entirely to mention the most important phenomena relating to discoloration in tooth substance. As the medical man and the student of dentistry are alike interested in this subject, if at all, from a practical and helpful standpoint, the chapter on discoloration in this 'American Text-Book' would have been far more complete and helpful if it had stated that owing to the greater vascularity of young teeth, they are far more liable to rapid and persistent discoloration than the teeth of adults, especially those of middle life.

"Teeth at this period exhibit greater density, with an apparent deposition of calcic matter and a consequent lessening of the vascular substance which forms the tubular and inter-tubular tissue. There are no discolorations of any moment from devitalization or other cause after the period of full consolidation. Satisfactory bleaching of a tooth, discolored from stasis or the fixation of decomposable matter in the tubular and inter-tubular substance, is an im-

possibility; therefore he, who, by good management, prevents discoloration is doing a service far greater than he who attempts an impossible bleaching.

"The chapters on extraction of teeth are well written and satisfactory. In the extraction of teeth and only here, medicine and dentistry seem to come to a common focus. From this point begins their divergence."

But it is not to the errors and antiquated teachings of our textbooks only that we appeal to justify the position that reform is essential and demanded in the teachings of dentistry. Turn with me to some of the misconceptions and errors that are ingrained in dental thought and teachings; some that have been so incorporated into its substance that they have become part of its warp and woof.

The first of these relates to the office of the teeth in our modern civilization. In defining the offices of teeth, emphasis is universally placed upon mastication as the chief function of these organs. I am aware that criticism will be aroused when I say that this teaching should be abandoned and something more in consonance with real conditions substituted. While the teeth are organs of mastication and away back in the savage state were practically a necessity to this function, in our present civilization they no longer stand in this relation.

Digestion, assimilation, maintenance of human life and health are attainable in a degree of perfection without tooth mastication. Indeed, there are many cases of infectious mouth conditions where conservation of health would be maintained more easily and better without teeth than with them.

The ordinary mouth with natural teeth carries a tooth surface that may be roughly estimated at twenty to twenty-four square inches in extent, varying with the size and number of the teeth. This large extent of tooth surface from lack of care in whole or in part, is very generally in a state of virulent infection. As this surface is exposed to much of the inspired air and washed and mopped in mastication by direct contact of foods, it will be readily seen that the amount of infection carried into the pulmonary and digestive tracts will depend largely upon the state of the teeth and their surroundings, whether septic or aseptic.

Perhaps a more vivid picture of this may be presented by considering for a moment the condition of an unwashed plate, spoon, knife

and fork. Such an outfit for serving food presents scarcely more square inches of surface than an ordinary set of natural teeth. Imagine conditions which compel or admit of serving food from a plate covered with infected mouth fluids, decomposed food remains, viscid, mucoid secretions and excretions, occasional drops of pus, disengaged particles of calcic deposits, the whole impregnated with odors from tooth decay, putrescent pulp tissue, bacterially infected tooth surface, and other septic conditions represented in the unsanitarized human mouth, and we have but another view of states and conditions presented in the oral cavity, the vestibule of life; too often, through ignorant inattention and neglect, converted into a veritable vestibule of death.

Day by day and hour by hour septic matter is swept into the digestive tract to reappear in days or months, or years, perhaps, in some form of systemic infection, and all because of the presence of natural teeth in the mouth. Does it not thus become evident that in many cases mouth conditions are a bar to the conservation of health, and that, unrelieved of septic conditions, the system may be better without teeth than with them?

Full preparation of digestible, assimilable, nourishing foods is readily obtainable without aid from the teeth. However convenient and pleasurable the mastication of food may be, the preparation of food by the teeth is by no means a necessity. This is fully attested in the case of invalids so often nourished and brought back to health with predigested foods or foods prepared for the stomach outside of the mouth. It is equally well attested by thousands upon thousands of the fully edentulous mouths.

If we seek out the old people of to-day we shall generally discover them with few or no natural teeth; and it is a matter of general occurrence that they have come into a better state of health as a result of parting with all of their natural teeth.

Where, then, is the emphasis to be placed on the uses of the teeth? When dentistry shall apprehend fully the facts, the emphasis will not be upon the necessity for teeth in mastication, but upon the pleasure they afford as an adjunct to mouth mastication.

The pleasures and delights of the table have been celebrated in all civilizations. Climes, purses and service have been laid under tribute to please and gratify the taste. No act of friendship is more highly regarded than the hospitality of the table. Wherein do the

teeth contribute to these delights? Largely by contributing to the pleasures of taste. The comfortable, unconscious use of the teeth in mastication affords a stimulus to gustatory pleasure and contributes a nervous aid to digestion which, in importance to the system, far exceeds any demand for the exercise of the merely mechanical function of mastication.

Our literature should be freed also from the error expressed in the thought that caries of the teeth is a *disease* and from such pedantic and meaningless deliverances as that which sums up an article of eleven pages in the *Dental Summary,* which says: "The predisposing factor in dental caries is diathetic and local treatment alone is inadequate to arrest it."

After more than fifty years of fairly successful effort in arresting decay by local means alone, this declaration must come as a distinct shock to the dental profession. It puts a bar squarely across all our past efforts and stamps every known method of treating decay as inadequate. The condemnation, as it seems to me, is not in failure to arrest decay by local means but in failure to do anything looking to the prevention of decay. If local treatment alone is inadequate to arrest decay, what is its twin helpmeet? Why are we not assisted by our author to discover it?

Dr. Talbot complains that dentists are not readers. In view of much that is written, the question may be fairly propounded, are they thereby great losers?

Coexistent with the above and even more damaging and belittling to the profession is the prevalent impression that decay is the principal and practically the only pathological condition with which dentistry has to do. Teachers see nothing and apparently care for nothing beyond this. In consequence the life of the student and the practice of the practitioner center around the treatment of decay in the teeth. Decay no more belongs to the teeth than to other osseous structures, save as the teeth are independent bodies and in the half open, half closed cavity of the mouth, are subject to constant varying environmental conditions.

Truth demands the uncovering of the fact that the decay of the teeth is not a disease; it is but the result of chemical activities and affinities which, in favoring environment, are working upon the dissoluble osseous organs in the oral cavity. In our search for the discovery of some occult cause for decay we have failed to recognize

the fact that chemical activities are governed by precisely the same laws of intensity and arrest that control these activities and affinities in other fields.

Pernicious tooth environment, attended always by lactic or other acids and heat, intensifies the destructive affinities to which the teeth are subject, and thus the condition we call decay is established and perpetuated.

Environmental states alone may cause rapid disintegration and decay of the teeth, or environmental states for the same teeth may lift the whole into complete immunity. In the true sense, the forces operating as the cause of caries of the teeth have not a dual relation.

A more recent, but a more pronounced error which has gained acceptance through our periodical literature, is that to make saliva a factor in, if not the prime cause of tooth decay, as well as to make it a purveyor of disease in the human mouth.

While mouth fluids, especially nocturnal mucus, are often exceedingly destructive to tooth substance, *saliva* in its action on all tissues of the mouth, not excepting the teeth, is most benign. There is no ingredient or element in it, harmful or destructive to these organs. Little attention has been given by either medicine or dentistry to the mouth fluids generally known as saliva. Medicine has analyzed what it calls saliva, and ascribed to it the initiatory function in digestion of converting starch into sugar.

Saliva, the secretion from the salivary glands, really has just two offices, that of moistening and liquifying the food, while it is in process of mastication, and that of enveloping the bolus in a smooth, mucilaginous coating to facilitate deglutition. Saliva is often spoken of as a fluid constantly present in the mouth. On the contrary saliva appears at stated intervals only and then only during the taking and masticating of food. Saliva comes from three separate sets of dual glands, so situated as to discharge conveniently their separate secretions into the mouth. The secretion from these glands is by no means a homogeneous fluid.

The largest of the salivary glands is known as the parotid. These glands are situated one upon each side of the face just in front of the ear. They have a crow-quill-like duct, opening into the mouth in the buccal mucous membrane opposite the first superior molar. They discharge their secretions into the mouth in consider-

able quantities (often in a stream) to satisfy the demands of mastication. It is a fluid limpid as the clearest water.

The second set of glands, the sublingual, opens into the mouth under the tongue just back of the lower incisors. The secretion from these glands is also limpid and apparently identical in character with the parotid secretion. The office of the fluid from these four glands is purely that of moistening the food in mastication and for its solution.

The third set of glands, known as the submaxillary, is situated under the tongue opposite the first and second lower molars. These glands discharge their secretion into the mouth through ducts known as the ducts of Wharton. The office and character of the submaxillary secretion are wholly different from those of the parotid or of the sublingual. This fluid is never poured out to be mingled with the food in mastication. It plays no part in mastication proper. It is the saliva of deglutition and is never discharged into the mouth except in the act of swallowing. In character it is a thick, distinctly ropy fluid, and when isolated, as is frequent in operations upon the lower first molar teeth, its mucilaginous or ropy character is distinctly recognized. Not infrequently it may be seen extending from the mouth of the patient even to the floor and having the appearance of a rope of mucilage. It is this normal state of the submaxillary secretion that has given the impression that certain mouths produce a ropy saliva very prejudicial to the teeth. Nothing could be further from the truth. This secretion is ropy in its normal state, and is discharged intermittently in considerable masses just as the bolus is leaving the mouth in its passage into the pharynx and esophagus. The raising of the tongue in the act of swallowing ejects a mass of this secretion which acts to envelop and lubricate the bolus in its passage to the stomach.

In normal conditions this secretion never reaches the anterior portion of the mouth; it does not even mingle with the food until in the act of swallowing. Its office is distinctively to assist and facilitate deglutition. We believe further investigation will show the secretion from the submaxillary glands to be the only part of the saliva having perceptible influence in the digestive process. If starch is converted into sugar by saliva it can be due to nothing but the chemical action of this odoriferous and highly impregnated fluid from the submaxillary gland. The parotid and sublingual secretions can have no more immediate influence than so much water.

A fact to be noted in connection with the salivary glands is the promptness and rapidity with which the secretion is taken from the circulation. They have no storehouse or reservoir; they secrete only to the extent required and yet the supply for the demands of mastication is ever ready. The limpid salivary fluids might, without disadvantage, give place to water, or other customary drinks, in many states of the mouth.

Water is not simply a food adjuvant, it is a diluent to the circulation and a necessity to digestion. It is an integral part of nutrition as necessary to digestion as it is to tissue replacement or the maintenance of life. With cessation of mastication there is cessation of secretion on the part of all salivary glands. This function is resumed only upon natural restimulation through presence of food, or by some unusual interference.

Operations upon the teeth frequently excite profuse flow from some one or possibly all of these glands. It is not uncommon for the parotid and sublingual to pour out their limpid secretion in large quantities, while the submaxillary is wholly undisturbed. Again, operations upon the lower jaw in the region of the submaxillary glands, especially upon the first and second lower molars, will cause it to pour out a continuous ropy stream, while the parotid and sublingual are seemingly dormant.

It will thus be seen that the term saliva, applied to the secretion from the so-called salivary glands, is a very uncertain designation. The scientist who speaks of analyzing saliva, while failing to distinguish the gland from which his specimens are taken, shows himself to be dealing most unsatisfactorily and unscientifically with the conditions that confront us. The limpid fluid from the parotid and sublingual glands can have no more influence upon decay in the teeth than so much pure water. The secretion from the submaxillary gland is of such a character and thrown into the mouth at such intervals, that it never comes in contact with the teeth; we can, therefore, absolutely eliminate *saliva* in all its forms as a factor in the production of decay in the human teeth.

Saliva is a wholly different substance from that scanty viscid fluid constantly present in the mouth. These mouth fluids are principally the product of the mucous follicles—small glands situated in large numbers just beneath the mucous membrane, especially of the upper lip. This follicular secretion, jointly with certain excretory

fluids which give natural moisture to the lips and mouth, is constantly present. But it is wholly different in character from the salivary secretions we have been considering.

Saliva in health is alkaline, mucus is acid. It is usually this mucus, ever present when the mouth is at rest, that has been so much analyzed of late by unfledged scientists as saliva. Periodicity in the flow of saliva, permits practically continuous activity of the mucous secretion and thus, undisturbed, it becomes a prime factor in tooth decay, and not less in other dental troubles. Its normal viscidity furnishes the most favorable conditions for retention of acidulated matter in contact with the teeth, in situations where decay begins. Solution of enamel and dentin, which we call decay, is a result of the perpetual presence of these viscid mouth fluids in contact with the teeth. Tooth substance will yield more or less readily to the power of these solvents according as the teeth are vascular or compact in structure. It may, therefore, be justly claimed that decay of the teeth is wholly the result of environmental conditions. Neither medicine nor dentistry, by any possibility, can reach the conditions upon which decay is dependent by other than local treatment.

We have not, at least now, the time to consider the many crudities and absurdities of lesser import that clog the wheels of progress in dentistry. Enough of a practical nature as we hope has been presented to demonstrate the proposition which forms the subject of this paper. Practitioners, however, need not await the advent of these reforms; they will appear in due course, both in our schools and in our literature.

One reform of greatest moment to ourselves and our patients stands ready for adoption at the hands of all who will. *Change of environment* for all teeth and all mouth conditions is the one effective weapon with which to combat the inroads of decay and meet the crying needs of a suffering humanity. Humanity is suffering physically, mentally, morally through long years of bondage to an unrecognized toxic mouth infection preventable, but unrelieved.

Change of environment, frequent, forcible, thorough, is the watchword for relief which should be rung out through all the confines of dentistry.

For "extension for prevention" substitute in practice *"extension of prevention,"* and thus stand face to face with the oral prophylaxis

treatment in all its masterful significance and all its relief-giving benefits.

DISCUSSION—*Dr. George Zederbaum,* Charlotte, Mich.: I do not believe that physicians should tell us what we should or should not do. A patient will come to us and say, "Dr. Blank said I should not take gas, or that I had better take chloroform." I believe it is up to us to decide whether we should give any or no anesthetic. Many times after you have completed some extracting operation, patients will go for further treatment to the physician who hardly ever knows anything about how to treat such wounds.

The teaching in the dental schools from start to finish is not what it ought to be. I notice that several new subjects have been added to the curriculum recently. The course ought to have been extended to four years and the requirement for admission ought to be more severe. The question arises, What shall be done with the men who are naturally good mechanics from every standpoint and can render good service quickly, but are deficient in professional culture? I know many graduates who cannot explain which was first formed, the enamel or the dentin; still, they will do a better technical piece of work than many of those who do know.

The teachers in our colleges should be of higher standard. In European countries they have better teachers. They are more thorough in whatever branch they take up along scientific lines.

Dr. Smith came here for the purpose of leading up in his article to the point of prophylaxis. He will find there is a prophylactic squad already in Detroit. I would like to ask Dr. Smith why is the mouth with the saliva (or decloudation?), as he terms it, of so unpleasant a smell; and also, if it is a fact that the saliva in the mouth is present only during the time of mastication? Why is it presented in abundance when we have the heartburn? There are many more questions which could be placed before Dr. Smith, which I am sure could be answered positively.

Dr. N. S. Hoff, Ann Arbor: I suppose it is up to me to defend the college and the teacher. I presume I was put on for this purpose. Are the dental colleges teaching up to the profession's attainment? The inference is that we are not; as the essayist says, the stream cannot rise higher than its source. Why should you expect your colleges to teach something that the profession does not intend to practice? Or why should you expect your dental colleges and

teachers to know things that the profession does not know; and if they did know them, how are they going to get these things into the minds of students, who do not know how to discriminate any better than you do? We cannot teach what the profession does not know, practice or endorse. I believe the colleges are teaching as nearly as is practicable for them. It is not practicable, under existing circumstances, for the dental colleges to do very much better teaching than they are now doing. You know the reasons just as well as I do. Our colleges are not endowed; we have no training schools for training teachers of dentistry, such as we have for training teachers in theology. The colleges ought not to be blamed for not doing something that it is impracticable for them to do. The dental college has done a grand work. If it were not for the dental college with its history of the past fifty years, I do not think our profession could occupy the position it does to-day. I do not believe, in the remarks that Dr. Smith made on this point, that he intended to discredit our profession in the sense that seemingly he has done. We know that he has honored it by giving himself to it, and I have no doubt he is proud that he is a member of it. I do not believe that if he had to make his choice again to-day he would take up the practice of medicine in preference to the practice of dentistry. Personally, I never have been tempted to take up the practice of medicine, go into the pulpit or into the banking business. I am satisfied with the field of dentistry; it is big enough for me. What little I know about dentistry I hope to make useful to the people who call upon me for it and need it. I believe that in practicing the profession of dentistry I can render just as good service in kind and just as humanitarian and divine a service as any clergyman in the city of Detroit, so far as my resources enable me. Dentistry is not a menial calling only so far as we make it so by our incapacity or indifference, and every conscientious teacher of dentistry is doing the best he can by precept and practice to instill this doctrine.

The essayist tells us that college training is too largely given up to the development of the technical or mechanical department. I do not think that is true. I am using what knowledge and strength I have as a teacher to develop the technical department, and I feel that we cannot develop it too rapidly or too highly. There is so much of the technical involved in the practice of the profession of

dentistry that we cannot ignore it. If we do, we shall lose our power and influence for good. Dr. Smith uses the technical methods in all of his work. What would his work be without the technical knowledge and training that he has? A gentleman who knows him, perhaps better than anyone else, said to me that he was the best all-around dentist that he had ever known. I should like to have someone say that of me. I do not mean that we should not also want to be dental scientists; but to be an all-around dentist, able to render dental service of any character and of the highest possible ability, ought to make any man feel that he was indeed filling an important place in the world's work.

I say that we cannot ignore the technical or mechanical side of our profession. If we do, we are lost. There is so much involved in the technical part of our profession that it is impracticable for us to ignore it. Ours is a technical profession, an artistic profession, and it can also support strong claims to being one of the scientific professions. It involves more knowledge, it seems to me, of the general sciences than many other professions. Surgery is a technical profession in all its branches. What would a surgeon be without his mechanical ability and skill? The surgeon does not depreciate the mechanical aspects of his profession. The man who is the best technical surgeon is the man who is most successful, providing he also has a good knowledge as a basis for his practice.

Dr. Smith has made a criticism of our text-books and literature. I think it deserves a good deal of criticism. I know a good deal about text-books and literature. I have been studying them ever since I have been in the profession. There is, perhaps, no text-book on any subject in all our curriculum that is satisfactory to any teacher. Even the teachers who write the text-books themselves are not satisfied with their own books. They cannot be, because our knowledge and technique are growing so rapidly and making such advances in all directions that no text-book three years old can be of any considerable value. This may appear to be a singular statement for me to make, but it is a fact that the text-books cannot possibly keep up with the professional progress that is being made. The text-book on crown and bridge work, that is five years old, is almost out of date. Of all works on practical dentistry the same may be said.

We have made all kinds of advances within the last fifteen years.

I veritably believe that no profession has made such advance in the same time as has dentistry. I do not feel that we ought to depreciate ourselves or our profession in any way, or feel that we are not making the progress that we should.

Does the student with a dental degree have only partial culture? Of course he has not. You could not make me believe that if you said it all night. I am surprised that Dr. Smith would quote the statement of such a man as made the above statement. Dr. Wood does not know anything at all about dentistry, the inner life of it, or what it means to be a dentist, or he never would have made such a statement. In a sense, it is partial culture just as much as medicine, theology or law, or any other profession is. Any professional study must be in a sense only partial culture, because we cannot have broad and general culture unless we spend a large portion of our lives in the pursuit of academic studies in the sciences and arts. How many men have found the time or inclination to do such a thing, to say nothing of the capacity, and if we all had general culture, of what value could we be in the world? We would be of no more value than the man who has piled up millions of dollars and never uses a cent of it for the good of mankind. A little knowledge of many things does not stand for culture, but rather a comprehensive knowledge of a few things will give one a reputation for wisdom and culture.

There are dentists who have only a partial culture, just as there are medical men and preachers and other men who are only partially cultured; but dentistry is capable of furnishing a man with the broadest kind of culture. There is opportunity in any department of dentistry for a man to become broad and cultured. Who is there here to-night who has heard this brilliant lecture of Dr. Smith who would feel able in any limited amount of time to compass the study of prophylaxis and its treatment that he has pictured to us, and yet it is only one of the aspects of dentistry. Dr. Watson will tell you what a broad field orthodontia opens for us. Dr. Oakman has made heroic sacrifices during the last three years, in more ways than I can tell, to get a better knowledge of general medicine that he may practice oral surgery. If you will ask him what he has gone through, what sacrifices of time and money and energy to get this knowledge, you will get some idea of what it

means to be a cultured man. When you expand that out into the broad field, who is there of us that is able to do it?

Does the dental degree give its holder the right to practice medicine? Of course not; but who wants to practice medicine? The practice of medicine is an art in itself. It may be true that the general public goes to the practitioner of medicine and gives him a higher appreciation for his opinion on diagnostic subjects. They even say for these medical men that they have a right, perhaps, as Dr. Zederbaum has said, to advise the dentist what he should do. I have no objection to a practitioner of medicine advising me; I am very glad to have him do so. I very frequently call upon my medical friends for advice, because I know they are in a position to diagnose conditions that I am not. I am very glad to consult my medical associates, just as I am to have my dictionary to consult for words I do not know how to spell. There is no need for the dentist to take on the practice of medicine. We have all we can do well in our own field, and we are more capable of practicing dental medicine than any medical practitioner can be, because we are dealing with dental diseases and the application of remedies for diseases that the medical practitioner knows nothing about. There is not a man who has practiced dentistry for any time who has not seen cases of malpractice in dental treatment coming from the hands of medical men. I know of two eminent medical practitioners who have made decidedly wrong diagnoses of two dental cases and failed in their treatments for lack of special training. When these cases were finally referred to a dentist, they yielded promptly to a proper treatment. You will find that men who are specializing in medicine do not desire to be advised by another medical man who is specializing in some other field, but, at the same time, they are very willing to take advice when needing it. As far as the dental degree giving the holder the right to practice general medicine, I think it would be a great hindrance to both medicine and dentistry. No man can do both as well as the people have a right to expect. We ought, however, to practice dental medicine, and practice it scientifically, as well as skilfully.

Dr. Smith makes the statement that true dentistry is yet to become the most important branch of the healing art. This is rather a strong statement, but he refers, of course, to his specialty of prophylaxis. I believe that the statement may be well within the

bounds of reasonable prognosis in regard to the specialty of prophylaxis. It may be true that prophylaxis is going to help dentistry to become a recognized specialty of medicine, whether the medical practitioners want it to be or not. We are going to be so important a factor in the treatment of diseases of the human body that they cannot help recognizing us. But our recognition is not coming alone from prophylaxis. The whole range of the practice of dentistry will have an important bearing on it. We can look forward to this prophylaxis treatment, along with other dental accomplishments, as great and powerful levers which are to help us to that recognition. It probably is also true that we are not making such progress as we ought to make; but we have made considerable progress for the time we have been at the business.

Dr. Smith says that no work has been done so far in the way of preventing disease. I cannot help but think of the work of Dr. Miller, which has made him our highest scientific authority on the etiology of dental caries. His work has been directed altogether toward the eradication of this destructive disease of the human teeth, and he is still working at it. All of his efforts are now being directed to the discovery of some agent which will prevent the destructive tendency of dental caries. It seems to me that what he has accomplished means something. His work is not out of date; it is still standard and it will be for many years to come. There are doubtless many other things to which the application of this knowledge will be brought in time, and we shall use it all for the purpose of benefiting humanity. We are making more progress than is apparent, and there are many things to encourage us to go on. Dr. Smith says he does not mean to take a pessimistic attitude toward this matter, but it strikes us that he does.

Dr. George Cook, Chicago: The essayist states that in 1839 we had one college, but now we have a great number, intimating that the number is now too great, because in '39 we had only one and got along with it, but he forgets that in '39 we did not have so many people. The population of the United States is now almost two-thirds more than it was in 1839. I don't think that we need be discouraged because of this fact, anyhow. We are beginning to treat our patients prophylactically, and this will take lots of time and require more men, because it takes a long time to clean

a tooth well. I can fill two or three teeth usually while I am cleaning only one properly.

We must take care of our bodies that we may protect the teeth to some extent. All diseases of the mouth are almost purely local, but we have no diseases unless there is a predisposition existing in the individual before that disease is contracted, so that we have to go further back than simply scraping off the tartar and taking a pine stick and swab around the tooth for a while, saying that we are prophylactically preventing decay, pyorrhea and everything else. We are not, because when we have cleansed it thoroughly the mucus will get back and soon house a great multitude of bacteria. The progress of dentistry has revealed this condition to us and has made it possible for Dr. Smith to found this great school of prophylaxis.

Many members of our profession who have not contributed anything in the way of sacrifice have given the most comforting relief from suffering that the world has ever known. Dr. Miller and Dr. Black and others have made great sacrifices, as we all know, for the benefit of the science of dentistry. There are plenty of men in the profession who are making almost heroic sacrifices every day.

Usually the sacrifices that I make professionally give me a compensating pleasure. I do not come to these meetings because there is a great revenue in it, but to get something that I can take back home and utilize in the practice of an art that has done something for humanity in the past.

I do not wish to discredit the special emphasis of Dr. Smith's paper, but his tone and attitude seem to me rather discouraging to a young man who supposes that he is entering a useful field of work. Those of us who have labored so conscientiously for so many years, like Dr. Smith and myself, are not worrying so much about our personal feelings in this matter, but we would like to leave the profession encouraged enough to go on and finish up this job of saving people's teeth. I would advise you not to get discouraged.

In my opinion, the majority of us have got the wrong idea of this prophylaxis treatment. Dr. Smith tells us that saliva is no more than water. I do not know where he gets his authority for this statement, and presume he thinks that it is true, but he is mistaken. There are organic and chemical constituents in saliva that are important elements of this prophylaxis treatment. I believe that true

prophylaxis goes back even to the very origin of life itself; because we find that all animals naturally are immune and all plant life is naturally immune to disease, and by certain environments they become susceptible and disease is contracted. I do not believe that we are always going to prevent pyorrhea or caries of the teeth by prophylactic means. I do not want to discourage you or your efforts at keeping the mouth clean, but you can produce erosion of the teeth by simply using the toothbrush and rubbing the teeth with sticks. I can produce degeneration of the epithelial cell in six weeks in a dog's mouth with a toothbrush. Scaling the teeth occasionally is an essential thing in a great many cases, but if we have the body as a whole in a perfect functional condition, I do not believe that we need to fear so much about our teeth if we keep them reasonably clean.

I was talking with an old fellow that lives in my neighborhood who is 84 years old, and I said: "How many teeth have you got, uncle?" "Every damn one," said he. "Hain't lost one yet." I said: "Ever used toothbrush, powders and mouth washes?" "Not a damn bit," says he. "I take a little whisky in my mouth once in a while, but that is the only thing that has ever passed my mouth, 'ceptin' somethin' to eat."

Dr. W. H. Jackson, Ann Arbor: All pyorrhea trouble is dependent on a condition of the system which makes the tissues weak and causes the gums to break down. You will almost always find this trouble associated with a rheumatic or gouty diathesis. If your case arises from a constitutional condition, local treatment may help it, but it will not cure. The systemic disease has to be cured in order to cure the local condition, and you have to treat constitutionally. You have to have a prophylaxis of the system, as you might say, before you cure that disease. If the case arises from local causes, then your treatment by prophylaxis will cure the disease; if not, it is a constitutional disease, and no kind of local treatment will cure it; it will keep on recurring.

Dr. E. B. Spaulding, Detroit:: I do not feel capable of criticizing Dr. Smith's paper, because of my experience with his other papers. The first time that I read one of his papers I thought it was the queerest jumble that I had ever read, and I did not get much out of it, but I laid it aside, and read it again and again several times. I think about the tenth time that I read that paper I got a great

deal out of it, and I was very pleased to find out later that Dr. Smith said it took him two years to write that paper. This paper that he has read to us to-night is like it, and will bear something more than a casual reading or hearing. I am sorry that it is not the privilege of every member here to see what a few of us saw in Dr. Smith's office some two or three months ago. He gave a demonstration that I do not think can be duplicated by any man in the profession of dentistry. From ten o'clock in the morning until about half past four or five in the afternoon (he did not allow us to go to lunch), he had patients coming in at least every fifteen minutes, to demonstrate what he had been doing for the past five or six years by his method of prophylaxis treatment. He not only showed us mouths that were most healthy, but reclaimed from conditions which it was very apparent had been the subjects of pyorrhea in extreme stages; he also exhibited mouths all perfectly healthy that he was maintaining in that condition, and showed us that he was not only a polisher of teeth, but that he made gold fillings the like of which I have never seen before.

The man who made the statement that Dr. Smith was the best all-around dentist he ever knew, ought to know what he was saying, because he worked with Dr. Smith for several years in his office. I only wish that Dr. Cook and all of you could have seen what we saw in that exhibit of results; you would certainly see that it meant something more than "a stick and a rag" treatment. Dr. Smith has high conceptions and ideals and he comes nearer realizing them than the most of us.

Dr. D. D. Smith, closing discussion: Let me try to correct the impression that seems to have been received that I look upon this subject from a pessimistic standpoint. I said in the beginning that I am not a pessimist, on the contrary, I am extremely optimistic. I told you that I believe dentistry will one day stand as the right bower of medicine. I believe that is coming to pass. In what I have written, I desire simply to focus your attention upon some important matters which the profession in its self-glorification has overlooked.

The presentation of this paper was for the *help* of young men, not to discourage. Dr. Cook has intimated that we cannot prevent mouth diseases, especially this one disease, caries, which dentistry is forever fighting. I tell you and Dr. Cook, however, after an ex-

perience of eleven years in preventive treatment, I am convinced that we can prevent it. Do you ask me if we can prevent all decay? I answer, No. But we can stop 90 per cent. of it, and if that is so, is it not worth while? It certainly is not done by any other means than by the prophylaxis treatment. This treatment properly administered will do one thing more, something that none of the old methods have ever been able to do: It will prevent the occurrence of alveolar pyorrhea; it will cure it where it is established and absolutely arrest all recurrence. Alveolar pyorrhea is not properly a disease, even though my good friend Dr. C. M. Wright, of Cincinnati, says he does not agree with me in that.

In the interests of general practice allow me here to correct the false impression that my practice is given wholly to the prophylaxis treatment. Possibly I turn away more patients every year than would make most young men a good practice; nevertheless, I do everything in the line of dental practice that comes to my office. I have given myself and my energies for the past ten years largely to this work, because I know it holds vast benefits for humanity. I want to see the dental profession moving forward; I want to see the young men in our profession elevated to a position where they shall command the respect of the medical profession. I respect the man who is able to accomplish the best results in the making of plates and in the use of gold, amalgam or porcelain in filling teeth, or who is able to do the best in any other department of dentistry. I am not decrying the mechanics of dentistry at all, and I am sorry if you have received the impression that I do. I believe in and exalt this department of dentistry which I lay before you, because it means so much more for the profession and for humanity. It ought to be known and accepted by every practitioner. It is practical, it is feasible, but it will require steady patience and tact.

If I have severely criticized dental literature it is because it deserves it. I have labored to be just, as I am optimistic in my views of dentistry. The time will come when gentlemen within the sound of my voice (I shall probably not live to witness it) will see among medical men a better comprehension of the pathological states and conditions of the human mouth and teeth in their bearings upon general health and disease, and then full recognition for the important and indispensable service of an awakened and enlightened dentistry will be given.

GOLD INLAYS.

BY CLARENCE H. WRIGHT, D.D.S., CHICAGO, ILL.

It is my privilege and pleasure at this time to offer for your consideration, a subject which stirs within me a greater degree of enthusiasm, perhaps, than any other pertaining to our work. We are to discuss a method of very extraordinary value, and, according to my own belief, the most useful of all methods of filling cavities of caries.

There should be no conflict between the porcelain inlay and the gold. Each has its distinct field. I believe, however, that the range of usefulness of the latter is far greater than that of the porcelain inlay. Unquestionably, the porcelain inlay is a work of great beauty and utility, and it is an accepted success in its proper sphere, but I believe it should rarely be inserted posterior to the mesio-occlusal cavities in the first bicuspids, though occasionally its use may be indicated in the shallow buccal cavities with extreme sensitiveness.

In a very large proportion of that great percentage of cavities found posterior to the cuspids, I firmly believe that the gold inlay is far superior to fillings of any other character. In fact, I unhesitatingly state that in my opinion the tooth in which reposes a skillfully made gold inlay, is better protected and the chances of permanency vastly greater than would be possible were any other process used.

The gold inlay in itself is quite indestructible in the mouth, and is absolutely unchangeable to the extreme margin. It has many times the strength of any other filling material. As a protection against recurrence of caries, I am satisfied it has no equal, for in ten years' use I have not seen a single case of such failure and have inserted gold inlays in a great number of cases of heroic nature.

An exquisitely adapted gold inlay, inserted under heavy pressure in fine cement, showing margins, with no visible trace of cement, seals the cavity much more securely than any other filling. Inasmuch as the margins are fairly well beveled and the inlay consists of an unyielding, almost steel-like material, which is accurately adapted and sealed with a fine modern cement, it is evident that the protection of margins and tooth walls against breakage is not to be approached by other means.

As we proceed with each step in the construction of a gold inlay, there is almost a certainty of exactness of results—a satisfaction not enjoyed by the adherent of gold foil and amalgam. We know almost to an absolute certainty that the most obscure and irregular gingival margin is safe and secure against recurrence of caries. It readily can be seen when burnishing the matrix over the margin that the metal is not deficient, but that it fully covers the difficult border and that the adaptation is accurate. When the inlay is completed we have definite knowledge of the safety of that margin.

The gingival margin always has been the most vulnerable point in all other classes of fillings, but in the case of the gold inlay, the obscure border far beneath the gum line is the point least liable to future disintegration. We never find a recurrence of caries in a root that has been skillfuly crowned, and surely the gold inlay is much more accurately adapted to that border than is the best of crowns to the root, and both exist under similar conditions. I am convinced that he who becomes adept in this class of work will have to his credit a percentage of permanent fillings quite unknown to the practitioner of other methods.

The use of the rubber dam is one of the most cruel and offensive acts perpetrated by the dentist, although a necessary process in connection with the old-style fillings. But with the gold inlay method the dam is rarely necessary or desirable, as the cavity never need be perfectly dry more than the few moments required in setting the inlay.

Another point most gratifying to many patients is the fact that at any moment from the beginning of the work to the completion of the inlay, the operation may be suspended and taken up another day. Thus it is possible to consummate the largest operations without overtaxing or exhausting the delicate patient. This often is a source of convenience and rest to the operator, also.

It is possible, also, to insert a gold inlay in a cavity so obscure and extensive that another method could not be considered.

It not infrequently spares the patient the ordeal of pulp destruction and crowning.

Further, we are by this means enabled to fill permanently the teeth of young patients, deriving all the benefits of the cements without the disadvantages, and having the great advantage of an indestructible metal.

I believe the gold inlay can be made in more different ways than any other kind of filling. In fact, the subject in general and the treatment of details of construction I find so great a task that I despair of dealing at all exhaustively in the matter at this time.

I will describe the details of procedure which I find most satisfactory in the great majority of cases: Prepare the cavity without undercuts, either cutting away or filling in with cement to avoid them. Do not, however, leave a saucer-shaped cavity, but have rather abrupt walls. Allow a fair degree of bevel to the margins, although they must not be rounded. If a proximal cavity, have the base incline to a slightly greater depth from the gingival border, or a slight groove running labio-lingually will suffice.

As a rule, in a bicuspid or molar, if the cavity be of fair proportions, it will be wise to extend it over into fissure or sulcus on occlusal surface. This will increase the strength of the inlay very greatly by taking advantage of the hooking and dovetailing principles, allowing the inlay to emerge upon the occlusal surface through a comparatively shallow and narrow channel into a deeper and broader depression. Any depth of cavity, abruptness of walls or suddenness of depression may be permissible, providing we leave no undercuts.

Using a small suitably shaped piece of air-chamber metal as a cup, take an impression of the cavity and tooth with modeling compound. In some cases a bite may be desirable. From this, make a plaster model, and if a proximo-occlusal cavity (a most numerous class), cut a slot on either side and break at a point between the cavity and the adjoining tooth. This gives model of tooth and cavity alone and disposes of the neighboring teeth. The parts of the model may be assembled for reference when desired. If time permits, I prefer to dry the model, then treat with very thin sandarac varnish, which is absorbed by the plaster and produces a very hard sharply defined surface.

Press the model of the tooth with cavity into Mellotte's mouldine and make a fusible metal die. For the matrix I prefer 34-gauge pure gold, burnishing and fitting to the die and then to the model, being careful to anneal frequently, and allowing the matrix to come just flush with the margins. I use 34-gauge gold because it is thin enough to submit to the most exquisite adaptation, may be forced quickly into deep and sudden depressions with little danger

of puncturing, and is heavy enough to handle safely and to allow the use of a fine file. If by mistake it is filed or cut excessively, the deficient edge may be placed on the anvil and burnished or rolled out with a round end burnisher to meet the margin. We expect our compound impression to be very inaccurate and consequently our matrix must be perfected in the mouth.

See that the cavity is free from any foreign particle and also absorb the mass of saliva. Anneal and burnish thoroughly to the cavity, holding the matrix firmly with one burnisher and burnishing with another. It is most important to anneal frequently during this procedure, and above all see that the matrix fully covers the margins, but with as little excess as possible.

After thorough burnishing, anneal again, insert in the cavity and swage with a piece of vulcanite rubber, using a piece that fills the cavity and covers the margins well. Use considerable force in swaging with finger or broad instrument. If a proximo-occlusal cavity, swage with broad heavy spatula or burnisher between the teeth and finger on occlusal surface. If, upon withdrawing the rubber, the matrix is dislodged, there is a possibility of its having been distorted. You will see that the outline of the matrix is marked on the rubber. Trim off the overflow of rubber, re-anneal, adjust and swage again, and the matrix will be found to remain in place. Gently dislodge and invest, and immediately pack a little dry plaster around the soft investment to absorb the excess of water and thereby lessen shrinkage and prevent breaking. When the investment has partially set, trim with a knife so that the surface of the matrix will be exposed and clean to the margin.

There are numerous ways of building up and contouring the inlay which cannot be entered into now, but the following method is one that I use in a great majority of cases.

Take Watts' crystal gold and platinum, tear off large pieces, anneal, and with broad foot plugger press gently to place in the invested matrix, but do not condense to any great extent—not more than would allow you to squeeze readily the mass out of shape with the fingers. When built to about the required contour it may be placed in the cavity in the plaster model with the parts assembled to guide in securing accurate contact. Do not jeopardize the matrix with undue pressure, but if there seems to be any risk in the matter,

the platinum and gold may be roughly packed into the plaster model first and pressed gently around the margins when in the matrix.

Now, remove the platinum and gold, saturate with liquid flux, absorbing the excess with a touch of a blotter. Return to place in the matrix and distribute pieces of 22k. solder over the surface and flow with the blowpipe, repeating the process until the structure is saturated. This material will absorb the solder and still maintain its approximate contour, and also impart a most pleasing color to the finished inlay. If the inlay be one of considerable area, pits or bubbles may appear upon polishing. In order to insure against these, it is my custom, in large cases, to contour or build on visible surfaces with the crystal, gold and platinum, adding lastly a layer of pieces of the matrix gold or plate, with pieces of solder sweated to place.

If a flow or deficiency should develop, it may be quickly remedied by adapting a piece of the gold and platinum or a bit of plate gold to the imperfect part, applying the flame. The solder will fill the pit.

Place in acid for cleaning, and roughly dress the inlay with coarse wheels on the engine, being careful to grind very little about the margins.

The under surface should be roughened or have some concavity or grooves. If the inlay be of fair proportions it is my habit to grind a concave space or slot, using a thin carborundum wheel, and deepening and roughening this space with a bur. In some cases (as for example, the large deep ones in the occluding surfaces of molars) simple slots filed on the sides will suffice for retention. After grinding or cutting such slots or depressions, it is well to grind or burnish the edges toward the depression in order to remove any particle of metal which may have spread in the cutting.

The inlay is now ready for insertion. If the cavity is in an obscure position, attach the inlay on the end of a round burnisher with sticky wax for convenience in handling. Dry the cavity, mix the cement thoroughly, place in the cavity, so that it will coat all parts of the surface and press the inlay in place with considerable force. When the cement has set, the polishing may be completed. I seldom see fit to make a strictly hollow inlay, and find that in nearly all cases sufficient space can be secured quickly by grinding and cutting to insure retention and obviate the ill effects of conductivity.

From my description it might seem an endless task to construct an inlay, and no doubt by this method it would consume considerable time if we attempted to complete the large and obscure case at one time. It is my custom in all large cases where these details are employed, to prepare the cavity, take the impression and dismiss the patient. Then at the next visit, perfect the adaptation of the matrix and complete the inlay, or it may be desirable to have the patient make a third appointment even. Many times, two inlays or other work can be constructed at the same time.

It is very satisfactory to have this kind of work in the laboratory to be taken up at odd moments and left at any stage, and you can in this way spend many an hour most profitably, which otherwise might be lost.

In conclusion, I will offer a few words of admonition and emphasis: Bevel your margins, but do not round them. In obscure parts, see that the matrix shows that it fully covers the margins. Burnish the margins vigorously and the finest scratch will be filled by the gold matrix.

As a general proposition, in using the blowpipe, bring a fair-sized, forceful blaze gradually to bear upon the solder, causing it to fuse and diffuse evenly. When ready to set the inlay, be sure that not the slightest foreign particle is in the cavity or on the inlay. Flush out the cavity and wash the inlay with a stiff camel's-hair brush and dry by dipping in alcohol and igniting. Mix the cement vigorously, but not too thick. In cases of considerable area, have it no thicker than will drop from the spatula. I would prefer exquisite margins with indifferent cement, to doubtful margins and perfect cement. When inserting, use considerable but well-guarded force.

I might add that I practice many variations from the method described. In fact, I occasionally employ methods totally different. The principles involved in gold inlay work are found to be of great value, other than in the simple filling of cavities, as for example in constructing crowns for very defective roots where accurate fitting bands would be impossible. Likewise are they valuable in bridge-work.

ANTIDOTE FOR SILVER NITRATE.—The use of a solution of sodium chlorid, after the application of silver nitrate to any of the mucous membranes, will do away with the great discomfort to the patient resulting from the application of this drug.—*Pacific Dental Gazette.*

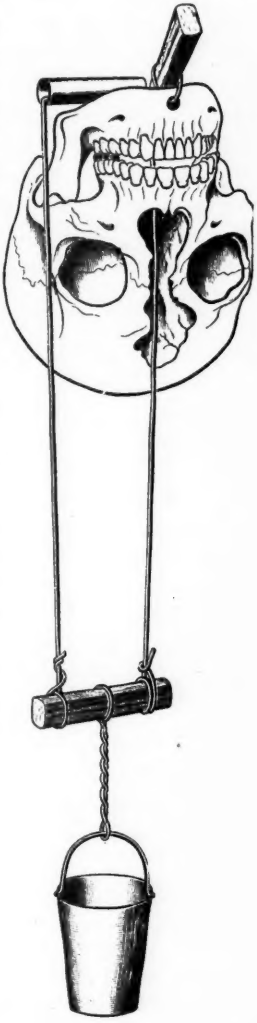
Digests.

THE HUMAN SKULL USED AS A GNATHODYNAMOMETER TO DETERMINE THE VALUE OF TRITURATION IN THE MASTICATION OF FOOD. By Joseph Head, D.D.S., M.D., Philadelphia, Pa. In 1895 Dr. Black explained his instrument for measuring the force required to chew food, and gave his figures, which have since filled the dental profession with surprise and wonder. His instrument consists of two molar teeth carved in brass, which are forced against corresponding teeth by a sliding bar. The stress is exerted on a spring and is registered on a dial plate. The force is applied in a purely up-and-down direction by means of a lever. This instrument does not give a grinding or triturating motion, so Dr. Black's experiments are confined to the forces required to chew food by a direct thrust, and viewed in this light there is no reason to question the accuracy of his results. He expressly states that he does not give figures on cereals because with cereals a triturating force is used by the teeth, and this force cannot be shown by his machine. He, however, believes that in the mastication of meat there is no trituration, but only a direct thrust, and that the direct thrust is most effective. He cites as further proof of this contention that purely meat-eating animals are precluded from trituration by the interlocking of the upper teeth with the lower. This last is open to the counter thought that while in carnivora there is no lateral jaw motion, there is considerable trituration by the teeth owing to the gliding past each other of the long, sharp cusps just previous to the locking. In fact, they give an absolute scissors motion, which is trituration carried to its utmost limit.

Dr. Black points out that long, sharp cusps with just a fair degree of closeness of the general surfaces and of contact seem to do the work better than a so-called perfect occlusion where there is absolute contact. This in itself would seem to favor the value and general use of trituration, for if the cusps fit loosely between other cusps like a pestle in a mortar, a direct thrust unaccompanied by a triturating motion would not tear meat, but only puncture it in a series of spots.

The following experiments have been undertaken from a curios-

ity to determine the amount of triturating force required to chew food, especially meat. For this purpose a natural skull with practically perfect molars of average size was used. The tests were all made with but two molars and their occluding teeth. This corresponded to Dr. Black's machine. The method of arrangement was as follows:



The skull was turned upside down and the condyles of the lower jaw loosely tied into the sockets. Attachments for weights were then made to one side of the jaw just opposite the space between the lower first and second molars. The skull was so tipped that the force of gravity during mastication would give a sliding or triturating motion. The method of attachment was as follows: A three-quarter-inch hole was bored through the palate, nasal chamber and frontal bone. A strong brass tube was then fastened across the body of the lower jaw, and a German silver wire run through with both ends hanging down. To the ends of these wires were attached a cross-bar and a bucket, in which could be placed the weights used for giving the masticating force to the occluding molars. The tube, wire, cross-bar and bucket were so arranged that the force of gravity would be evenly and directly applied to the teeth in question. A wooden handle was attached to the lower jaw for the purpose of raising it when food was to be inserted between the teeth preliminary to the masticating test. In making these tests great care was observed to apply the force slowly, as it was noted that a sudden snapping of the jaw upon the food

would bring into play momentum, which is not a factor in natural mastication.

The first experiments were with bread. Dry, crisp crusts broke at 15 pounds' pressure. But a mixture of soft inside and crust, such as we ordinarily find, could not be bitten through with a force of 60 pounds, which was all that was considered safe to use for fear of breaking the skull. The crust and inside formed a dense, immovable mass. But when a little saliva was placed on this same mass it was readily masticated with a force of 3 pounds. Dr. Black notes this behavior of bread, and points out why so many of our patients break their teeth when they were, to use their words, "only biting a soft crust of bread."

The tables for vegetables are as follows:

Asparagus, roast onion, peas, roast potato were chewed with 1 lb. to 2 lbs. pressure.

	lbs.	Dr. Black lbs.
Raw cabbage	16	40-60
Raw onion	4	
Head lettuce	2	25-30
Radish, whole, broke, at	20-25	20-25
Radish, pieces, pulverized, at	10-15	35-40

These give a fair idea of what pressure the vegetables under a slight trituration will demand. It is noted that my test of radish, 20 to 25 lbs., is exactly that obtained by Black, as with so large a thing there could be no trituration. With lettuce, where trituration was possible, only 8 lbs. was needed, where 25 to 30 lbs. was required by the direct thrust of Dr. Black.

Following is a table of the forces necessary to masticate meats, where a slight trituration is used:

	lbs.	Dr. Black lbs.
Corned beef	18-22	30-35
Boiled beef	3	
Tongue	1- 2	3- 5
Lamb chop	16-20	
Roast lamb	4	
Roast lamb kidney	3	
Tenderloin of beefsteak, very tender	8- 9	35-40
Sirloin steak	10, 20, 43	
Round of beefsteak, tough	38-42	60-80

	lbs.	Dr. Black lbs.
Roast beef	20-35	35-50
Boiled ham	10-14	40-60
Broiled ham	10-13	
Pork chops	25-30	20-25
Roast veal	16	35-40
Veal chops	12	
Roast mutton	18-22	

Dr. Black's figures, as shown in part, average very much higher than those given by the skull. I also give his interesting table for comparison where different foods are used:

	lbs.
Boiled corned beef, nice and tender	30-35
Beefsteak, medium well done—chuck	40-60
Beefsteak, well done—chuck	45-60
Beefsteak, rare, very tender—loin	35-40
Beefsteak—round	40-50
Beefsteak, well done, rather tough	60-80
Mutton chop	30-40
Mutton steak	35-45
Roast veal, tender	35-40
Roast beef	45-60
Roast beef—loin	30-35
Pork chops—loin	20-25
Roast pork	30-35
Boiled ham, nice and tender	40-60
Cold boiled tongue—central part	3- 5
Tongue—near root	15-20

It will be noted that Dr. Black's direct pressure averages much higher than the tests made with a slight trituration. Pork chops and tongue are the only meats that come below 30 lbs., and most of his figures go as high as 40 or 50 lbs. Concerning trituration figures on tenderloin and sirloin, it is interesting to note that in one steak the tenderloin was particularly tough. The tests bore out these impressions. The tenderloin was afterward found to masticate at 8 lbs., while the sirloin took 43 lbs. Other sirloins, as indicated by the table, readily crushed at between 10 and 20 lbs.

The figures seem to indicate that trituration in the mastication of food is a great help. Of course, there may be and probably are many people who, having great force, crush their meat with 80 to 100 lbs.—just for the pure joy and habit of crushing it,

whether it crushes at 4 or at 80 lbs.; but a man who has artificial teeth and has had trouble in learning to use his teeth will find the value of trituration and will use it to the full extent.

Dr. Black's figures on the direct force required to crack candies and nuts are well known and are apparently indisputable. They need no comment, since they do not concern trituration. As has been before stated, this question of trituration was in Dr. Black's mind and was carefully considered. For reasons that appealed to him he thought the direct thrust did the work with the least effort. Dr. Black by his dynamometer has conclusively proved that the human jaw is capable of exerting a pressure of 150 to 300 lbs., which is certainly sufficient to meet any demands, but it is still a question whether we ordinarily chew meats by direct force, using from 30 to 80 lbs. pressure, or whether we, through habit, use trituration and thereby greatly reduce the amount of force required.—*Dental Cosmos.*

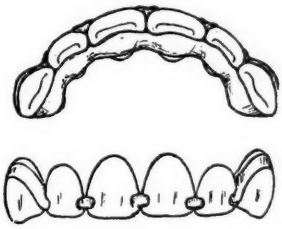
SUPPLEMENTARY RETAINING FORCES AS AUXILIARIES TO THE LABIAL RETAINING APPLIANCE. By Calvin S. Case, D.D.S., M.D., Chicago, Ill. A labial retainer has been in use in almost every case in my practice for the past ten years. It has, therefore, been well tried, and were I deprived of its use the successful practice of orthodontia would be considered by me impossible.

This retainer, as shown in Figs. 1 and 2, will perhaps be recognized by some dentists who doubtless have been given an opportunity to examine one or more of these appliances out of hundreds that have been and are still being worn by their patients. If so, I trust they will be willing on this occasion to attest to their perfection. They not only hold the teeth firmly, but are by far the least conspicuous of anything yet constructed which firmly grasps and immovably retains the teeth to which attachment is made. They, moreover, are fitted so closely to the teeth, with freedom from irritating prominences, that they are willingly worn any length of time, the only requirement being that they shall be examined occasionally, and if found loosened in the slightest degree, removed and recemented.

After the correction of nearly all simple and complex irregularities, and also in classified irregularities, if the above six-band

labial retainer be properly constructed and attached, it will commonly be found sufficient in itself to retain perfectly the teeth, even though the buccal teeth, which may have been considerably moved, are not involved in the grasp of the fixture. This, of course, presupposes that the upper and lower teeth have been brought to the

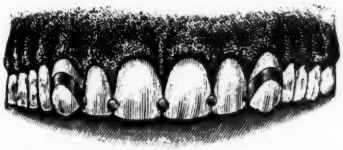
FIG. 1.



desired relative positions, and that the cusps of the buccal teeth perfectly interdigitate, though perhaps not in typically normal occlusion. There are, however, a number of important supplements to this appliance which will be demanded for the retention of extensive movements.

If one arch has been laterally expanded to the desired occlusion with the normal opposing arch which has not been moved, the simple six-band labial fixture shown in Fig. 1 will usually retain the

FIG. 2.

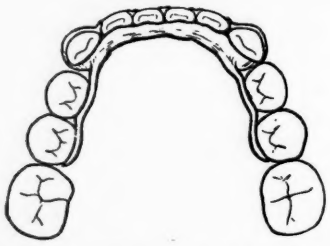


expansion and any changed curve or alignment of the labial arch. But if the operation has been performed without due regard to the forces of occlusion, and the opposing arch has been allowed to remain laterally contracted, the stability of these unmoved teeth will surely drive the expanded teeth back to their former position. This force of occlusion frequently will be sufficient to bend or displace any labial retainer that is not of unusual proportions, and finally will complete the failure of the operation after the retainer is removed. When both arches have been laterally expanded—as they should be in the last-named condition—if the lower expansion

be supported with a clasp-metal bow No. 16 or 14 soldered to the lingual face of the six-band labial retainer, as shown in Fig. 3, the forces of occlusion in connection with the regular upper labial retainer shown in Fig. 8 usually will be sufficient to hold both arches in position.

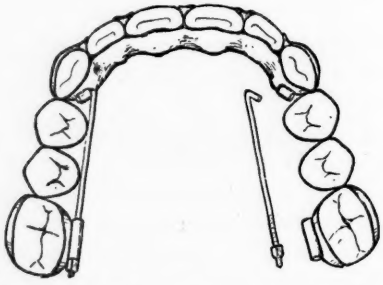
With certain occlusions it may be found expedient to attach the

FIG. 3.



lingual bow to the upper arch instead of to the lower, and in some instances to both. The length of the arms and the size of the wire for the lingual bow will be governed by the demands of the case. If the distal area has been much expanded, with a demand that the arms extend to the molars, they should be supported by thin lingual

FIG. 4.

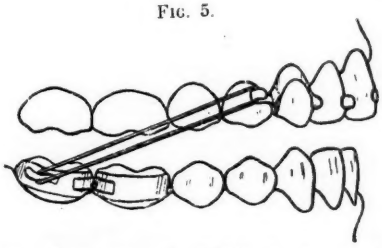


tubes soldered to No. 36 gold molar bands, and with every precaution in finish, for cleanliness and non-irritability.

When all of the upper or lower labial teeth have been retruded to reduce decided protrusions and to close spaces occasioned by the extraction of bicuspids, the labial retainer should carry thin No. 19 tubes soldered to the linguo-distal borders of the canine bands, as

shown in Fig. 4, for the purpose of attaching the appliance to the molars, either at the start or upon the first indication of a return movement. The traction bars are of either No. 19 or 20 German silver, provided with distal nuts, as shown in the drawing, or preferably with mesial and distal nuts, to lock them firmly in the lingual tubes attached to gold molar bands. This will enable one to keep all interproximal spaces closed, and if at this time the occlusion be perfected, it will be found sufficient. In many cases in which the age of the patient and the position of the teeth, etc., favor permanence of retention, the lingual bars and molar bands are not attached at first, though the lingual canine tubes in these cases always should be placed in the construction, to be employed if found necessary. These tubes being small and lying

FIG. 5.



close to the gum, when properly finished give no irritation or annoyance.

Cases which are protrusions of the upper teeth, to the extent that the buccal cusps interdigitate fully the width of a bicuspid in front of a normal occlusion, usually should be corrected by the extraction of the first or second bicuspids. The buccal teeth in the course of the operation—if employed as the sole anchorage force for retruding the labial teeth—may be forced slightly forward of an interdigitating occlusion, and then, if employed as in Fig. 4 as the sole means of retention, will tend to be dragged farther forward by the reacting force of the front teeth. There are many cases in which in the original state the upper teeth in relation to the lower teeth were protruded, perhaps to the extent of a full width of a bicuspid, but which according to dentofacial relations was found to be due partially or wholly to a retrusion of the lower denture, and consequently corrected with the intermaxillary force without extraction. In either events, hooks of No. 28 clasp metal are soldered to the labio-

distal surface of the canine bands, and formed to protect the bicuspids from the action of the elastics, as is shown in Fig. 5.

In all cases where the intermaxillary force has been employed extensively for the disto-mesial correction of malocclusion, nothing but a continuation of this character of force in a milder degree seems capable of retaining the position gained, notwithstanding the fact that the teeth at times have been brought to perfect or normal interdigitating occlusion. Moreover, where the final movements for the disto-mesial correction of malocclusion can be accomplished with the intermaxillary force alone, the labial retainer as described may be attached for this purpose as soon as the six anterior teeth are corrected in relation to each other.

In determining the character of the lower appliances for using the intermaxillary force, warning cannot be repeated too often in regard to the care that should be exercised in the application of a

FIG. 6.

mesial force through this medium from opposing teeth, as the same rules here obtain as in major movements. These are in the main—

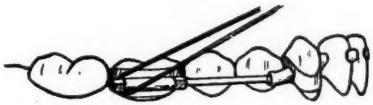
First: When no mesial or extruding movement of the buccal teeth is desired, the anchorage hooks for the elastics should be placed at the most distal points possible, and attached to a two or three band stationary anchorage. (Fig. 5.)

Second: If a mesial movement be desired and the extruding tendency of the elastics be feared, the intermaxillary hooks should be attached to the most distal points of single molar bands—preferably to the second molars—which are anchored down with No. 19 or 18 bars, the distal ends of which rest in short tubes upon the anchor molars, and pass forward, under hooks or through short open-tube attachments on the first molars and bicuspids, to rests upon the canines. (Fig. 6.) All of these bands should be as thin as the desired strength will permit. With this combination the extruding force upon the anchorage will be inhibited by distributing the extruding force to all the buccal teeth, while a mesial tipping of the crowns will be permitted through the possibility of the con-

tact points sliding upon each other. If an arch bow be employed instead of the bars, the incisors may be attached to it also, if desired.

Third: If the extruding movement be desired, following the correction of a short or close-bite malocclusion, the elastics should be attached to the single *first* molar bands or to the crowns which were employed to open the bite, and the balance of the apparatus so arranged as to distribute the force to the bicuspids. In a large proportion of these cases the lower arch and malaligned or malturned incisors have been corrected, demanding the employment of the six-band labial retainer. In these instances it is frequently desirable to connect directly the lower labial retainer to the intermaxillary anchorages, which enables an even distribution of the protruding force to the lower front teeth and a complete relief to the bicuspid area, so that these teeth will not be crowded out of line by contact pressure. This is one of the common methods employed by the

FIG. 7



author in the mesial action of the intermaxillary force upon the upper or lower arch when the front teeth are in alignment. (Fig. 7.) To the labio-distal surfaces of the canine bands of the retainer are soldered flattened tubes which are bent to receive the mesial ends of No. 18 or 19 bars, the distal ends of which are locked, with mesial and distal nuts, in buccal tubes upon the first molar bands or crowns. When the intermaxillary elastics are looped over the distal nuts, or attached to special hooks, the force may be distributed directly to the labials in phalanx. The bars may also be employed to correct or retain the bicuspids.

The most common malocclusion, for which the intermaxillary retainer is especially applicable, is that in which the upper buccal teeth have been moved distally, and the lower have been moved mesially to a normal occlusion, and corrected without extracting. If the forward movement of the lower teeth has not been sufficient to produce an abnormal labial inclination of the front teeth or to force them out of alignment, the intermaxillary buccal anchorages for elastics to the upper labial fixture, as in Fig. 5, will usually be

found sufficient to retain the occlusion, though when a still further forward movement of the lower teeth is desired, the methods shown in Figs. 6 or 7 will be indicated.

When the lower teeth have been moved forward considerably with the intermaxillary force, it is presumed that the incisors have been kept bodily in an upright position with the contouring apparatus. Upon removal of the regulating appliances, the contour retaining apparatus (Fig. 11, described later) should be attached to the lower, in connection with the intermaxillary labial retainer upon the upper. It is, perhaps, needless to say that when the upper and lower conditions are reversed, the same apparatus reversed will be equally applicable.

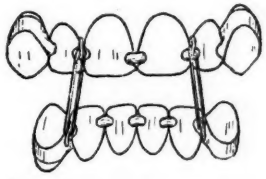
The amount of intermaxillary force to be applied during the period of retention should be governed by the needs of the case. It should not be at any time in excess of a force that is sufficient to retain the position gained—that is, providing the teeth are fully corrected when the retainer is placed—as this would necessitate stopping the force every once in a while and allowing the teeth to go back, and it is this swinging back and forth in the sockets that is especially opposed to the formation and solid fixation of permanent retaining alveoli. It is far more advisable that the weight of the elastics be gauged to a degree that will hold the teeth perfectly, while they are being worn continuously. Faber No. 5 (ticket rings) are the same size in circumference, but only about one-half the weight of No. 6 (election rings), of which single and double are commonly used for regulating. No. 7 (thread bands) are the same weight as No. 6, but being about twice the size will exert less intermaxillary force than No. 5.

I frequently correct the labial malrelations of the arches and place the front teeth in proper arch alignment, then make the retaining apparatus as above before the disto-mesial malocclusion is corrected, knowing that the intermaxillary force can be gauged to any degree, and that it will act quite as perfectly in retaining or in moving the teeth, if properly applied, as with the regulating device. The teeth are not so liable to be forced out of alignment, and the appliance is far less conspicuous than the usual regulating appliances; while the rigidity of the retainer, holding the labial curve of the arch in its corrected position, is of the greatest aid in preventing the reactive forces from laterally contracting the entire arch.

The correction of extensive open-bite malocclusion has always been the most difficult to retain of any of the characters of irregularity, because of the impossibility in most cases to obtain a stable hold upon which to anchor the retainer that would successfully combat the force of reaction. Where a lingual or labio-buccal bow is anchored to the molar teeth for this purpose, the reactive forces upon the open-bite labial teeth tending to intrude them will usually force the distal extremities of the bow and anchorages in the opposite direction, extruding the molars, which in itself will open the bite still further, as any movement at this point will be magnified in its action upon the front teeth. The intermediate teeth also, which are employed in this method as fulcrums to the elastic force of the bow, are frequently intruded.

These difficulties are now overcome by soldering small spurs to

FIG. 8.



the upper and lower labial retainers, as shown in Fig. 8. To these are attached direct intermaxillary elastics by the patient, which are worn continuously at all times when not interfering with required functions. This force should be continued until the forces of reaction are completely overcome. As most of these patients are mouth-breathers at the time of operation—the habit having continued long after the causes are removed—the elastics also subserve the purpose of aiding the patient in overcoming this unhealthful habit.

In the correction of many cases of decided upper protrusions—especially those in which the incisors are in an extruded position and thus in unpleasant evidence in relation to short upper lips, and particularly in close-bite malocclusions—the occipital force, with its backward and upward direction of movement, has proved an indispensable auxiliary. Again, in the correction of open-bite lower protruded malocclusions, the occipital force applied to the lower labial teeth is one of the most valuable and effective forces for

closing the bite, and for aiding in the retrusion and extrusion of the labial teeth after the extraction of bicuspids.

In both of these characters, the tendency of the reactive forces is often difficult to overcome for a time with dental retainers alone. Nor does one always obtain the full desired results of these movements at the time when everything else is finished and ready for the usual retaining appliances. In these cases, therefore, a No. 18 iridio-platinum wire is soldered to the interproximal extensions of the six-band labial retainer, and in such a position as to span the central incisors, as shown in Fig. 9. The bar, which crosses well above the medium extension of the appliance, forms a perfect rest for the occipital bow A on the upper, and bow B on the lower. Small rings soldered to the bow on each side of the lips prevent lateral motion. This occipital apparatus worn at night and with a moderate degree of force will give little or no annoyance, and will

FIG. 9.

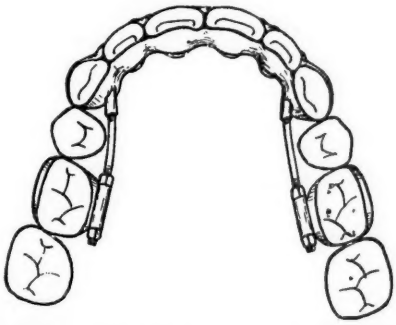
exert an evenly distributed force upon all the labial teeth to which the retainer is attached. In many cases for which it has been employed in this way, it has accomplished results that would have been otherwise impossible.

In the contemplation of retaining teeth which have been moved bodily, the magnitude and peculiarity of the force of a lever of the third kind, which has caused the apical ends of the roots to move, are quite as important to consider as the direction of the movement. The retaining appliance capable of fully sustaining this movement must be one that will combat forcibly the great reacting tendency of the elastic bone-fibers of the alveolar process to return to equilibrium. As this force is exerted along the entire length of the root, it is evident that the stress upon the comparatively narrow zone of the crown which is grasped by the retaining appliance increases as the force approaches the apical end of the root—on the principle that the advantage of a lever of the first kind is increased by lengthening the power arm. Therefore the necessity is apparent, in this character of retention, of employing distally extended arms which are exceedingly rigid in quality, and attachments to the re-

tainer. This is especially true of bodily protruding movements of the labial teeth, which so commonly carry the entire alveolar ridge forward in a manner that could not be accomplished other than by bending and stretching the cancellous structure of the alveolar process at the apical zone of its attachments. With bodily retruding movements of the labial teeth, the obstructing process in the pathway of the moving roots is more largely resorbed, and consequently they are far more easily retained.

When a bodily protruding or retruding movement of the incisors has occurred, which has not been accompanied by a movement of the roots of the canines, the six-band labial retainer, attached firmly

FIG. 10.

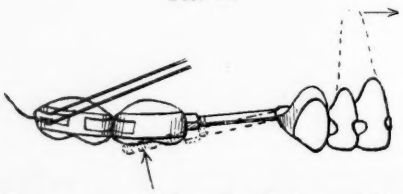


as it is to the canines, will aid greatly in retaining the root-movement of the incisors, though it should always be supplemented with rigidly attached lingual bars to the molars. Fig. 10 represents the common retainer employed in these cases. Rigid No. 14 bars are screwed into long-bearing tubes soldered to the lingual surfaces of the regular six-band labial retainer. The bars rest in lingual molar open tube-attachments with lock nuts to insure stability. In the final assembling and placing of the appliance the bars are bent up or down, so that when sprung into the tubes they will exert a slight extra force upon the roots in the direction of their movement; then the anchorage tubes are closed around the bars and the projecting edges and corners are smoothed to prevent irritation of tissues. In addition to retaining the teeth, the forces of movement may be increased by bending the bars and turning the nuts.

Where extensive protruding movements have been produced, the

incisor bands of the labial retainer should be sufficiently wide to cover the entire lingual surfaces, to which they are perfectly fitted in order to produce a wide and perfect grasp upon the crowns. When rigid bars are firmly attached to these long bearing bands and the ends sprung into open tube-attachments on the molars, they exert a "pull" force at the incisal zone and a "push" force at the gingival zone, which is transmitted to the entire root, as shown in Fig. 11. In connection with this, if the ends of the bars are threaded for mesially acting nuts, the appliance can be made to exert a similar —though less powerful—force to that of the regular contour apparatus. (Fig. 11.) Because of its inconspicuousness it may be preferably employed from the start in minor bodily protruding movements of the incisors. In all cases where it seems desirable to re-

FIG. 11.



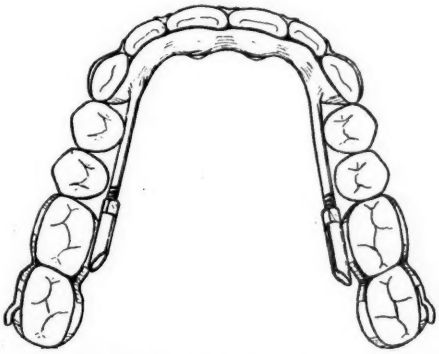
move the regular apparatus before the full completion of its work, it will be found invaluable for holding the position gained and for continuing the movement. This apparatus is described as follows:

The contour protruding retainer shown in Fig. 12 is constructed with a view to combat the reaction of root-movement, also to continue this force, and, if necessary, the bodily movement to a slight degree. To the lingual surface of the labial retainer, instead of the usual enforcement plate, is soldered a German silver or, preferably, a clasp-metal wire bow, No. 13 or 14. The contact surfaces of the bow are filed to fit the lingual surfaces of the band. In attaching the bow to the labial bands an abundance of solder should be forced well over the lingual surfaces of the bands to reinforce their stability and to remove from the surface irritating prominences. The distal ends of the bows are threaded to lie in open lingual tubes upon molar anchorages, which are provided with buccal intermaxillary hooks. The same care should be exercised in fitting the bow to lie along the lingual surfaces of the teeth, and the ends to lie evenly in the tubes, as was described in fitting the power bow in the regular

contour apparatus. Finally, with this apparatus the ends of the bow are bent, at the points where they join the labial retainer, toward the occlusal plane (see Fig. 11), so that in the final assembling after the cement has hardened, the ends are sprung toward and into the open tubes, which are then closed around them. The distal ends of the tubes and bow should be beveled and finished to present no irritating surfaces.

In Fig. 11 the bicuspids are removed from the drawing to show the lingual bars. The dotted lines and arrows indicate the principles of action. It will be observed that the spring of the bow, in combi-

FIG. 12.



nation with the rigidly attached labial retainer, is calculated to exert a protruding force upon the roots. This force will be in proportion to the amount of bend that is given to the bow in the final placing, while the protruding force will be otherwise controlled by the nuts at the mesial ends of the tubes. If at any time it is desired to increase or reduce the protruding force upon the roots of the labial teeth, the bow can be bent easily with the curved wire benders shown elsewhere. The intermaxillary force is an important auxiliary in sustaining the stability of the anchorages, and as an aid toward a general protrusion of the upper teeth and retrusion of the lower.

When this apparatus is employed principally for bodily protruding the incisor teeth—as it may be in all minor cases, with the view of subsequently forcing the canines and first bicuspids forward by inclination movement with push bars from the anchorages, or with the production of a mesial movement of all the buccal teeth with the

intermaxillary force—the incisors should first be placed in relative alignment, and the four-band labial retainer should be constructed with the lingual bow attached, etc., as described above. If the canines and first bicuspids are to be moved forward with the view of inserting an artificial bicuspid to sustain the arch, buccal tubes should be soldered to the anchorages for No. 18 push bars, to be employed for this purpose later in the operation.

The unusual enthusiasm in the practice of orthodontia which has arisen in the past five years—largely through the recently created impression that the regulation and retention of teeth is an operation that can be easily accomplished with very simple appliances—has perhaps by this time become somewhat cooled under the tests of experience, and therefore we may hope for a more willing acceptance of long-tried principles and methods, which, because of their greater complication, appear to demand a higher order of mental and physical training, but which I am sure will be found in the trend of true success.—*Dental Cosmos.*

A STUDY OF THE MUCOUS MEMBRANE, WITH SPECIAL REFERENCE TO ORAL PROPHYLAXIS. By George W. Cook, D.D.S., Chicago. For the last few years, it has been my privilege to study, both from a physical and chemical standpoint, a number of biological phenomena that appear in the oral cavity. We find the oral cavity a variable field for the physiological processes in bacterial life.

The action of inorganic and organic substances on the living cells and tissues has been a subject for innumerable investigations, physiological, as well as pathological. From all that has been formulated as fact, one would at once say that the inorganic salts remain as inorganic salts in protoplasma, or enter into a loose chemical combination with living proteids; and that their presence there gives special significance to certain cell activities, both qualitative and quantitative, and seems to go hand in hand with the phenomena of valence velocity and electrical potentiality. Not only may the salts of the so-called electrolytes combine with the protoplasma, but they are constantly entering into chemical and physical activities with tissue. According to Osborne, there may be salts present in the proteids that are non-disassociable, or, in other words, that are removed from the living cell with great difficulty. These electrolytes

play a great part in the physical processes that are constantly manifesting themselves in the life energy of the cell.

These salts that are found in the nucleo proteids are decidedly acid in character and are also little, if at all, disassociated; while those that enter into the loose combination of the cytoplasma of the cell are, as we have just said, actively engaged in the physiological processes, and are salts that are easily disassociated.

It might be said, in this connection, that globulin contains an acid salt, which is easily disassociated and can readily be dialyzed from the cell substance.

According to Holmgren, mucin contains an acid salt, which is usually present in the mucoid substance of the oral mucous membrane, and probably exists there as a sodium salt.

The part that is played by the mucoid salts is of vast importance in certain digestive processes, as they appear in the salivary secretions. The most important ones come from the mucous membrane or mucous cells of the lining of the mouth. These salts play an important role in the amylolytic digestion of starch. It has been observed that this diastatic action can be produced in a slightly alkaline substance, but it is possible to accomplish this when the solution has been acidified with hydrochloric acid.

Without going into the chemical changes that take place in the action of ptyalin, suffice it to say that this digestive process is interfered with, when any foreign substance, and especially when any metallic substance, is present in the slightest appreciable amount. Therefore, as a general proposition, the mouth should be kept extremely free from any agent that is likely to retard, or in any way interfere with this action of the digestive processes.

Ever since the elucidation, by Miller and others, of the fact that bacteria are constant inhabitants of the oral cavity, and that these organisms play an important role in the causation of dental caries and other oral pathological lesions, the profession of dentistry has been seeking an agent that will destroy the bacteria of the oral cavity, completely losing sight of the fact that the oral mucous membrane, for the best maintenance of the digestive processes and for the protection of the deeper structures from serious pathological lesions, should be kept in the most healthful physiological ocndition.

When we take into consideration the fact that the mechanism of the mucous membrane in itself is protective against any foreign

parasitic life, and the fact that the mucous membrane plays an important part in furnishing a neutral chemical field for carrying on certain digestive processes, we gain the great fact that no agent should be used as a bactericidal; for such a compound will invariably produce harm, not only in that it disturbs the action of the ptyalin of the saliva, but in that it renders the functional activity of the mucous cells incapable of furnishing the various compounds that are so essential to the enzymes of the saliva, and in that it many times destroys the true mechanical structure of the mucous membrane, thus changing it from a physiological to a pathological structure. Sometimes, however, the morphological appearance of the cells is but little changed, while their functional activity may be very materially interfered with.

Retrogressive metamorphosis of the cells is observed in certain epithelial mucous membranes and mucous glands. The change in the cell itself consists in showing vacuoles in the cytoplasma of the cell; these vacuoles become larger and larger, until they expand the cell into a goblet shape. The vacuoles that appear in the cell are in the mucoid material of the cells, and are very largely the substance of the changing cell. This change continues in cell after cell, the vacuoles being cell contents until the cells completely lose their function and no longer remain as even pathological cells, but become dead cells.

In a study of the morbid physiology of the mucous membrane of the human mouth, after using any of the so-called germicidal agents, or even those that are feebly antiseptic, the mucous cells are found to degenerate gradually, and instead of having constantly discharged mucin in the normal quantity and the normal chemical constituent, it becomes a pseudomucin. This, on chemical analysis, shows that it does not contain the chemical elements that go to make up the normal mucin. The so-called paramucin interferes materially with the diastatic action of the saliva in the digestion of starch. In some portions of the mucous membrane of the mouth this mucoid cellular degeneration extends to the deeper cells, and in some instances will progress even to the connective tissue cells. This condition is especially observed in the gum tissue, where the gingival border grows thin and white, and gradually begins to recede from its normal position on the necks of teeth. When just such tissue changes are observed, if the history of the

individual, and especially of the care of the mouth is obtained, it will be found that person has been using tooth powders and mouth-washes without any regard to what deleterious effects they may have on the tissues surrounding the teeth. The connective tissue cells, and more especially the cells of the mucous membrane, show the presence of mucous droplets in the cytoplasma. The next step in the degenerative process is in the nuclear degeneration of the cell. The nucleo always stains pale and quite indistinct, showing that, during the degeneration of the cytoplasma of the mucous cells, nutrition of the nucleo has been interfered with, and that, in the nucleus there is a loss of the chromatin substance, which interferes with the regeneration of mucous tissue.

Mouth-washes that contain any of the heavy metals, if used indiscriminately in the pockets of pyorrhea alveolaris, or on those so-called spongy gums, will always produce in the cells a change from the physiological to the pathological. While various forms of zinc have been universally recommended in certain conditions of the tissues of the mucous membrane, they will render the mucous cells abnormal; the slightest trace of this metal will prevent the action of ptyalin on starch for an indefinite period of time. Zinc and various other members of this group of metals, like mercuric compounds, iron, copper, etc., prevent the digestion of starch from one to six hours after the use of the metal in the mouth. The same is true, although not to such an extent, in cases of solutions of the various essential or volatile oils.

With these hydrocarbon compounds it is quite essential that some of the vegetable alkaloids, as tinctures containing astringent properties, be used in combination. With few exceptions, the alkaloids have a stimulating effect on protoplasma, without producing irritating conditions. Therefore they will cause regeneration of cell substance.

If the true biological action of drugs and their value as agents in treating pathological lesions are taken into consideration, it must be said that, in the majority of instances, drugs form chemical compounds with some molecule present in the protoplasma, and thereby act upon all cells according to the affinity of a drug for particular cells. This action may become detrimental to cellular regeneration, and in this way interfere with all physiological processes in that particular tissue with which the drug comes in con-

tact, until the part becomes diverted from a physiological to a pathological condition. With but few exceptions, this is the development which may be expected from the use of the various mouth-washes that are at present on the market.

Granting, however, that many of the mouth-washes render the mouth alkaline and may act feebly on some of the bacteria present, they nevertheless act detrimentally to certain epithelial mucous cells and destroy the bacteriolytic power of the mucous membrane and the mucus itself. Certain mucoid substance coming from purely physiological mucous membrane has an inhibitory power on the virulent action of certain forms of bacterial life. No better illustration on this point can be given than the one of diphtheria, where the individual is predisposed to this disease up to a certain period of life; after this period has been passed the pathogenic organism of this disease may, and does, exist many times in the human oral cavity without manifesting any of the local or constitutional symptoms of the disease. The principal reason for such a phenomena is due to the fact that the mucous cells have an inhibitory action on the bacteria of this disease. All cell life from the lowest to the highest is endowed with certain protective influences, but this immunizing influence, as we have suggested above, can be easily rendered non-protective. This is a fact so well known that it needs but little emphasis at this time.

Too much stress cannot be placed on the idea that disease is always a process resulting from the action of a series of factors of unequal value, and that in the treatment of disease, let it be from so-called local or from the general condition, the individual must always be treated, instead of the disease itself.

There are, however, certain hygienic conditions which, if followed out, will not only prevent, but will cure diseases. In speaking of the specific cure of diseases, and especially those that are looked upon as parasitic, we ordinarily look forward to something of a chemical substance acting as a disinfectant only upon certain species of bacteria, many times losing sight of the fact that a substance might be introduced which would act as a stimulus to the body cells of the human organism, and in this way cause the cells of the body to become a disinfectant in themselves. Chemical substances that act antiseptically on bacteria do not always act as a stimulus to the cells of the human organism. On the other hand,

they have a specific deleterious effect upon the cells of the higher organism, leaving a condition of the tissue predisposed to the action of certain parasites, and defeating the very end it was hoped to obtain.

After a long clinical observation in oral hygiene, and after reviewing all the experimental data that I have been able to obtain, the latter development is the one that is most commonly accomplished by the oral therapeutists, especially in their effort to practice prophylactic measures. In experiments that I carried on, under the guidance and suggestions of Drs. Mathews and McGuigan of the physiological laboratory of the University of Chicago, I took the various mouth-washes on the market at the present time to determine their efficiency as bactericidal agents, as well as their effects upon the cells of the higher forms of life. We found few agents, usually designated as mouth-washes, which in most cases did not act more detrimentally upon the tissue cells than they did upon bacterial cell life. We came to the opinion, after observation and experimentation, that any of the agents now used, with but two exceptions, cause degeneration of the mucous epithelial cells, diverting their functional activity from a physiological toward a pathological condition. Each of these two mouth-washes contains a member of the benzin ring, with some of the hydrocarbon compounds.

All of those agents, which are active oxidizing agents, produce very deleterious effects upon the enzymes of digestion; not only do they act upon the enzymes of oral digestion, but they act upon the pancreatic enzymes as well, preventing the action of these digestive ferments to an almost ungovernable degree. Neither do they have more than a slightly antagonistic effect upon bacterial life. The cleansing of the mouth and teeth by the methods most common with these agents, in the course of five years, if a stiff toothbrush is used, will cause a degeneration of the mucous cells, attended with a recession of the gums from their normal position around the necks of teeth, and will, in addition, cause a destructive influence to the digesting of all of the carbohydrates, and of pretty nearly all of the substances known as the nitrogenous compounds. A stiff-bristle toothbrush may be used in a large number of cases; but instead, where there is a tendency to white, thin gingival margins, a soft cloth should be wrapped around the finger and the parts massaged. In this way a great deal of pressure or undue force

is avoided. This treatment is especially necessary over the six anterior teeth, if the teeth are inclined to be short and the upper lip correspondingly short, so that there is considerable gingival margin exposed to the action of the lower borders of the upper lip.

I am very much inclined to agree with the views of Dr. W. D. Miller, who is of the opinion that friction plays an important role in erosion of the teeth. I am quite convinced that where there is erosion along the gingival border, and where there has been more or less recession of the gum tissue, on inquiry it will be found that the individual has been using a stiff toothbrush, and in a great many instances a coarse tooth powder. In such a case, if a microscopic examination of the soft tissue is made, it will be ascertained that the mucous cells have almost completely degenerated and that but little of the tissue substance, other than the interstitial and connective tissue, remains intact.

In oral prophylaxis it is important that the gum tissue be not injured with toothpicks, rubber dam clamps and ligatures. If such an accident occurs it is always advisable to bathe the injured part with pure sterile water, as hot as it can be used on the part without producing severe pain, gently massaging the gum with the finger, and then painting the injured tissue with iodin. When such a treatment is necessary the patient should be taught to draw silk ligature between the teeth, for the purpose of removing particles of food, without letting the ligature pass abruptly through the contact point and injuring the gum tissue in the interproximal space.

The best results to be obtained, where there is inflammation of the gum tissue, is to remove all foreign agents, such as calcific deposits, etc., thoroughly massaging the gums with repeated applications of hot water, as hot as can be borne. After this has been accomplished, and especially if there be thin, anemic gum tissue, apply Liquor Iodi Compositus (Lugol's solution), not in large quantities, however, but on a small piece of cotton dipped into the iodin with the excess of the solution removed, leaving just enough of the iodin to stain slightly the tissue. If the gums be of a red, inflamed and somewhat hypertrophied condition, run an instrument around the free margins. It will be found that very fine deposits will be at the bottom of these pockets, not extending far under the free margin of the gum. A solution of iodid of

potassium can be applied after massaging the gums and treating them with the hot water, as previously stated.

The instructions to patients, after the dentist has fully performed all of his duties, are twofold. First, they should be instructed as to their general healthful exercise, food and diet, and the part these will play in the maintenance of a healthful body. Second, they should be instructed to use mouth-washes, prescribed by the dentist only. The dentist in charge of the case should take into consideration the habits of the patient, and make inquiry into the care of his teeth.

Mouth-washes or tooth pastes containing any of the essential oils, benzoic or salicylic acid, never should be prescribed unless there is something to counteract the depressing influence these agents have on the mucous cells of the mucous membrane. And as I have previously stated, there is nothing whereby this can be accomplished except in some of the vegetable alkaloids.

Oral prophylaxis means nothing more nor less than to keep the free margins of the gum tissue in a healthful condition and to see that no deposits remain for any great length of time under the gingival border. Massaging the gums is one of the most efficient ways of keeping them in a healthy condition. If the oral mucous membrane is in a perfectly healthy condition, the nervous system is in perfect equilibrium, and digestion and assimilation are fulfilling all the functions required. Prophylaxis of the oral cavity is as easy to regulate and diseased conditions are as easily handled as any of the rest of the body. Systemic functional activity, in a normal way, is all that is really required in the normal performances of any part of the body.—*Dental Summary.*

DOES THE "LEAKY" FILLING LEAK? By J. Edw. Line, D.D.S., Rochester, N. Y. Whether in practice for one year or for a dozen, the general practitioner is ready to enter it as his judgment, based on careful observation and some experience, that a more or less deeply shaded halo or border of mourning around a gold filling is proof positive that somewhere about the margins of the cavity the material and tooth are not in contact, and that the oral secretions have access to the deeper parts of the artificially filled excavation. That the dark halo or border mentioned is not infrequently due to

Note.—"Halo" is usually defined as "a circle of light;" the halos referred to herein are better described as "approximate circles of dark."

the cause usually assigned is conceded; but that this is the case in even 50 per cent. of affected teeth may well be doubted.

Where non-contact of material with tooth can be demonstrated we find, if the conditions are not modified by repair or renewal, that the cloudiness about the filling increases in all directions, and also, as a characteristic, that it is continuous with the similarly clouded appearance that leads to the periphery of the tooth and filling; in other words, to the margin of the cavity. We speak of this as a "characteristic" of the filling that leaks, for such appearance is totally absent in the "leaky" filling that does not leak. Another feature of the filling that leaks is the progressive disintegration of the tissue of the cavity-wall, dentin or cement, the enamel usually

a. *b.*

a. Incisor cut longi-mesio-lingually. The dark part within the enamel shows diagrammatically the dead granular layer and adjacent dentin. b. Proximal cavity (filled) with cloudiness at short distance from cavity margins, due to dead tissue beneath enamel.

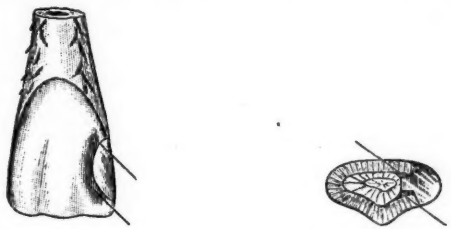
suffering later through crushing, and this for want of its normal dentinal support. And still another feature suggests itself in the fact that on removal of the filling that leaks, the deeper parts of the cavity are found to be soft and moist, a condition of things never met with in cavities that merely wear the badge of mourning, but do not leak, and never have.

By way of introduction to the special phase of the subject in question, it is desirable to glance at the hard tissues of the teeth, their relations to each other, and the way in which they are put together.

Of the three hard tissues, the dentin, covered by enamel and cement, constitutes the bulk of the tooth. Enamel may be stripped from dentin by means of acids; dentin may be stripped from cement by the same means, and both dentin and cement thus obtained remain practically intact except as to their inorganic constituents. If

cement could be stripped from dentin after the manner of enamel, the ivory element of the tooth would present to the eye a roughened, granular surface, characterized by Huxley, when describing the beginnings of dentinal formation, as "the no-man's land of calcification." This rough, granular-surfaced layer is coextensive with the surface of the dentin. It is known as the granular layer, the "stratum granulosum" of those who prefer dead languages.

To the student of histology it has small meaning unless he has at least looked into embryology. This granular layer gives no hint of a membrane, and yet it marks the boundary in enamel-covered teeth between dermal tissue, as represented by the tooth pulp and its product, and epidermal structure, as represented by the enamel. It



c. d.

c. Incisor showing cloudiness to left of filling; due to dead dentin forming part of deeper cavity-wall. d. Transverse section of c.

is a good example of place occupied by a structure that gives no hint as to its ancestry. And yet it corresponds perfectly as to position with tissue, or the semblance of tissue, known as basement membrane wherever epithelial and connective tissues are opposed, as in the skin, mucous and serous membranes. And while it may not be a membrane in the true sense of the term—that is, a tissue separable by mechanical or chemical means from tissue to its right and left—it may be optical and as such appreciable because of or through this apposition of contiguous tissues. Suffice it to say that whether a structural tissue or only the appearance of such, its position and extent are clearly betrayed by the granular layer.

Passing from further consideration of this localized layer of partially calcified tissue to the tooth as a whole, we call to mind that normally it is translucent; deprived of its source of nutrition—the pulp—it is opaque; that this opacity is directly as the relative quantity of organic matter is high as compared with inorganic, and that,

finally, this opaqueness is inversely as the age of the tooth at the time of the death of the pulp. To make this a bit clearer, if possible, the more organic matter the greater the opacity of the tooth and the deeper its shade as compared with its neighbors. Again, the younger the tooth at the time of death of the pulp, the greater the opacity—a condition that grows worse and worse with advancing years in that particular member.

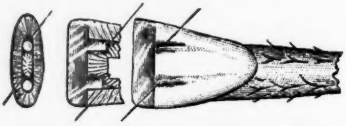
Now this absence of translucency, this deepening of the shade

e. *f.* *g.*

e. Proximal cavity (filled) in bicuspid; lines point to dead tissue cut off from direct communication with pulp. f. Bicuspid, showing dead tissue beneath enamel. g. Grinding-surface aspect of f, with cloud effect on all sides. Common in young teeth, also in adult teeth of poor dentinal structure.

of the tooth, simply means death of the dentin; also of whatever of life is possessed by the enamel, whose nutritive supply comes by way of or through the dentin.

What is true of the tooth as a whole is true also of its parts; hence we find the granular layer, when exposed to the oral secretions, dead, and later the subjacent dentin, and with this death not only



h. Lower incisor shod with gold, anchored by means of Mack's screws; vertical and transverse sections. These screws necessarily cross-cut the dentinal tubules; death of injured tissue follows, the cloudlike effect showing through the enamel.

opacity of the overlying enamel but actual discoloration. The course of decay may be in part directly across the dentinal tubules; this cuts off the outlying tissue, and as a result it dies and discolors. The same thing happens in a degree when cuts are made transversely to the dentinal fibers in the preparation of a cavity for filling, say from the mesio-incisive angle of a central or lateral. The part cut off dies of starvation, with the appearance, sooner or later,

according to the structure and age of the tooth, of a cloudlike patch in the isolated district.

That this is due to structure and age of the tooth, and wholly independent of defects between tooth and filling at the cavity margins, is proved by explorations, by observation, by the absence of communication between the discolored patch and the periphery of the tooth, and on removal of the filling, by the practically perfect dryness of the deeply shaded tissue, and in many cases by its equal density with tissue closely approximating it.

In the case of gold filling there is no contribution by the filling material to the tooth tissue discolored; the gold is as bright on removal from such conditions as on the day of its introduction.

In the case of amalgam the conditions are wholly different. The

i. *j.* *k.*

i. Incisor showing effect of patch of dead dentin adherent to enamel forming part of cavity-wall. j. Wrinkle in gold, or slight space between two cylinders; air in confinement. k. Angle intended for incisive anchorage filled with dust from bur and excavator.

surface of the material in contact with the dentin undergoes a chemical change, the expert tells us; the silver is acted upon by sulphur from the dental tissue, yielding silver sulphid, a black precipitate that adds materially to the off-color normal to the tissue alone. The same thing may be said, in part at least, of tin.

Cement, while intact as a filling, adds nothing to the shading dependent upon death of the tissue; in fact, it may be made to modify the color scheme materially by using for the first layers a very thin mix, and working it into thoroughly dried tissue.

All kinds of results are obtained with guttapercha stopping; its varieties and the uncertain conditions under which much of it is worked mitigate ill effects at one time and aid and abet such at another.

In closing, attention may be called to cloudiness about parts of a filling, due not to the presence of dead tissue nor to leakage, nor to a precipitation of filling material, but to the absence of filling

material itself. The operator may have failed to carry his gold to the full depth of the pit for anchorage, or overlooked an out-of-the-way corner; or again, he may have clogged and wrinkled his gold, or failed to condense to the limit two or three cylinders that were a bit too hard at the start, with the result that there is the appearance of leakage, due wholly to want of contact between filling and cavity wall.

The so-called "leaky" filling does not leak. The appearance of leakiness is really due to dead dentin beneath the enamel; this dead dentin is chiefly in the region of the granular layer; and it may be any dentin cut off by decay or by means of an excavator from its nutrient supply. This appearance is intensified by chemical change in and precipitation from the surface of the filling. It is wrinkled under clear enamel by air spaces chargeable to the operator in his failure to effect contact of filling material with the cavity-wall.—*Dental Office and Laboratory.*

SOMNOFORM. By A. O. Hunt, D.D.S., Omaha, Neb. Anything relating to the use of anesthetics in a dental practice is always of absorbing interest to the profession. This new anesthetic, Somnoform, was first given publicity before the Association Francais for the advancement of Sciences by Dr. Roland, director of the Dental School of Bordeaux, and late house surgeon of the Paris Hospital.

The data presented here are compiled from a paper presented by Dr. Aguilar, of Madrid, Spain, before the Fourth International Dental Congress at St. Louis, in 1904, which contains the result of Dr. Roland's clinical and laboratory experiments, as well as Dr. Aguilar's experience in his own and hospital practice in Madrid, with a report of results in the use of Somnoform in various European hospitals. Also the clinical experience with this anesthetic as reported by Dr. Paden in a paper read before the Chicago Medical Society, April 11, 1906.

The confirmation of the laboratory experiments by the record of 1,500,000 favorable cases shows the advantage of this anesthetic over chloroform, ether and nitrous oxid.

In order that an anesthetic should enter the respiratory tract and act on the nerve centers, it must be in the gaseous form, and the rapidity of its absorption is in direct ratio to its degree of diffusibility. This is the force which causes the blood corpuscles to be-

come saturated with the narcotic vapors instead of the oxygen; therefore the action of the gas on the nervous system will be rapid in proportion to the rapidity of saturation. Dr. Roland presents the problem of anesthesia in the following propositions:

First: To produce anesthesia it is necessary that the tension of the anesthetic gas be superior to that of oxygen, so that it may, in a certain proportion, take the place of the latter in the pulmonary alveoli.

Second: The tension of a gas being proportionate to its volatility, the more volatile the gas is the easier can it be made to take the place of oxygen.

Third: The ideal anesthetic, if such is attainable, would be the one behaving in its conditions of entry, of sojourn, and of exit from the body, as does oxygen.

If we follow the course of oxygen in the body, we see that the red blood corpuscles, after becoming charged with oxygen in the lungs during inhalation, distribute it to the tissue throughout the body. The blood corpuscles have their period of activity during their course through the arterial system. When the oxygen has been given up, the corpuscles return through the venous system to the lungs in an inert and dormant state, and there, by contact with oxygen, resume again their former activity. Now, as about 25 or 30 seconds are necessary for a red corpuscle after leaving the heart to return to it, we can say that in the diagrammatic division of the circulation in two parts, one arterial and the other venous, the action of the oxygen would last from 12 to 15 seconds; therefore an anesthetic capable of being absorbed practically in the same manner as oxygen should produce its effect in about 15 seconds, and when the administration is discontinued it should be eliminated in proportion, as the corpuscles of the blood come again into contact with the oxygen. This, almost to exact precision, is what takes place with somnoform.

Somnoform has a powerful action on the sympathetic system, increasing the arterial tension and the frequency of the cardiac contractions. A series of curves of the blood tension taken with the sphygmograph of Marey and the sphygmomanometer of Potain on the radial artery of Dr. Roland showed in 20 minutes the variation of from 13½ of normal blood pressure to 14½, 17, 17, 13, 14, 15, 14, 14, 13½ during, through, and after the anesthesia. The pulse,

which formerly was 76 per minute, presented in the same observation a frequency of 76, 84, 76, 68, 68. Respiration, which, when normal, was 16 per minute, went up to 28, 20, 19, 20, 20. A careful microscopical study of the blood of subjects under somnoform showed that the anesthesia of from 5 to 18 minutes' duration produced no important modifications in the blood. The urine of the anesthetized persons also remained normal.

Microscopical studies of the cerebral centers show the modifications produced by somnoform on the neuron. The neuron, as is well known, is the anatomical nerve element, or the nerve cell and its branches, as discovered and investigated by Ramon y Cajal, of Madrid, and is composed of three parts; first, a center part that is a real cell, with its protoplasms containing elements with and without peculiar affinity for coloring matter, and its nucleus; second, a peripheral part, made up of protoplasmic branches and the various ramifications (dendrites), with ends which do not anastomose; and third, the more peripheral part, formed by the axis cylinders, which do anastomose.

The investigations were made on the cerebrum and cerebellum of rabbits and cats: first, on nonanesthetized animals (control subjects); second, on the animal at the end of the anesthesia, varying from 5 to 15 or 20 minutes; third, on animals at the end of a prolonged anesthesia (one hour or more), and fourth, on the animals one hour after consciousness had returned.

The staining of tissue was made by the rapid method of Ramon y Cajal, of Madrid, and by the method of vital staining of Ehrlish by the intravascular injection of Gubler's methylen blue. In the right carotid artery of the animal experimented upon, injections were made every five minutes of from 2 to 10 cc. (according to the size of the animal) of methylen blue. At the end of half an hour the brain case was opened and the microscope sections were obtained. The researches were always controlled on anesthetized animals.

The changes brought about in the neuron by somnoform differ in the various regions of the cerebrum and cerebellum, also in accordance with the duration of the anesthesia.

FIRST SERIES: SHORT ANESTHESIA.

Cerebral Covering.—The pyramidal cells with their branches remained normal; they did not change in size. The chromophile

granulations of the protoplasm could be clearly seen; the nuclei were normal.

Cerebellar Covering.—The methods of Golgi and Nissl show the sharp modifications undergone by the cells of Purkinje, a slight deformation and irregularity of shape. The protoplasmic prolongations were varicose. It appears that from the beginning of the anesthesia the mixture has a particular action on the nerve elements of the cerebellar covering.

SECOND SERIES: DEEP AND LONG ANESTHESIA.

In this series of experiments the guinea pigs died after 15 or 20 minutes. Cats, as well as rabbits, resist for several hours. When fragments of the nerve centers have been removed from the living animal, or from an animal which has just died, the results obtained by the examination are the same, and the modifications are as clear in the cerebral as in the cerebellar covering.

Cerebrum.—The cells diminish in volume. The protoplasm presents excessively clear zones, and the protoplasmic branches remain intact.

Cerebellar Covering.—The modifications of the cells of Purkinje are very marked. The protoplasmic branches are deformed and present varicosities and knots.

THIRD SERIES: ONE HOUR AFTER RECOVERY.

There was a return of all the elements to their normal state excepting the cells of Purkinje, which are slower to regain their normal form.

Speaking of these experiments, Dr. Roland concludes as follows: "Somnoform has an elective action on the cells of Purkinje, thus suppressing sensitivity to pain and temperature—its passing through the cerebellum; and when there is saturation or excess of the anesthesia the pyramidal cells are impressed, determining loss of consciousness." It only remains to state that the results of this observation show the minimum of danger is incurred in the administration of somnoform, which, during a short operation, causes sleep, without in any way acting on the cerebral covering. This selective power on the part of certain substances for a definite portion of the nervous system should not be surprising to us. We know, for instance, that chloroform, ether and alcohol have in their action a preference for the cerebral covering; that cocain in moderate doses acts on the peripheral endings of sensory nerves; that strychnin

shows a preference for the cellular elements of the anterior columns of the spinal cord; that nicotin paralyzes the nerve cells of the sympathetic ganglia; that curare acts on the motor nerve endings. These experiments show conclusively that somnoform acts first on the cerebellum and secondarily on the cerebrum.

Somnoform, as is the case with any other anesthetic, determines in the patient three well-defined states: First, pre-anesthetic period, or that of induction; second, anesthetic period, or that of resolution; third, post-anesthetic period, or that of elimination or return to consciousness.

In each one of these periods we observe two types of phenomena, subjective and objective.

The subjective phenomena in the first period are emotional; a feeling of anxiety, of suffocation, blurred vision, tinnitus aurium, light tickling in the extremities, and the strange sensation of having a warm compress on the cerebrum from the occipital to the frontal lobes.

In the second period, or that of the true anesthesia, the patient experiences no sensation whatever.

The third, or post-anesthetic period, commences by the sensation of a far-away buzzing, the return of the sense of hearing, dreams of different types, gay, religious, amorous, professional, etc., generally in relation to the subject of which the patient was thinking immediately before the anesthesia. At first he fails to recognize the place and the persons that surround him, this state being followed by the return of motion and with a tickling in the extremities.

Clinically, we can group the patients into three classes, as follows:

The first class, embracing 90 per cent. of all cases, is constituted of those patients who are tranquil and unresisting. With a dose of from 3 to 5 cc. (cubic centimeters), in from 15 to 30 seconds, they are anesthetized, and they remain so for from 50 to 70 seconds, and sometimes for nearly two minutes. When they regain consciousness they are pleased, and express satisfaction and wonder at the slight amount of inconvenience they have experienced.

The second class will be more difficult to anesthetize. It comprises the restless class of patients, who involuntarily resist anesthesia. When the administration begins they fight to get the mask off the face. They swallow, but do not breathe, at first; sometimes they

cry out, but finally lapse into unconsciousness. These patients are found in the proportion of 8 or 9 per cent.

The third class of patients is constituted of the alcoholic, epileptic, hysterical, and tobacco users. They are difficult to anesthetize, and the elimination of the anesthetic seems to have on them an hysterogenic action, provoking a nervous crisis. Fortunately, patients of this kind will be found only in a proportion of about 1 per cent.

Always employ a mask or inhaler in preference to a handkerchief or waterproof cone, with which it was originally applied. The inhaler will permit, not only the exact measurement of the dose employed, but also rapid induction by reason of the total exclusion of air—a factor of great importance. After seating the patient, with the head in line with the body, explain that deep inhalations should be taken, that the liquid has a slightly irritating odor, and that it will produce a quiet and agreeable sleep, particularly if he can induce himself to think of something pleasant. The pneumatic pad of the inhaler having been inflated and tried on the patient's face, pour the somnoform from the bottle into the chamber of the inhaler in the dose of 5 cc., or the contents of a capsule; close the chamber very rapidly, and instantly apply the facepiece. Generally in about 20 seconds the action of the agent will begin, and the signs of general anesthesia will be evident, namely, cessation of the ocular movements, drooping of the eyelids, dilatation of the pupils, complete relaxation, occasionally rigidity of the arms and the loss of corneal reflex. The induction is complete in from 30 to 45 seconds, and the anesthesia lasts from 60 to 90 seconds. The pulse slightly increases in frequency and tension, and the color of the face remains completely normal, without trace of the cyanosis that appears when nitrous oxid is employed. When recovery of the patient begins, analgesia persists during some seconds, allowing a little more time to operate with the patient in a semi-conscious state. In four or five minutes the patient completely recovers.

Somnoform is being rapidly introduced in hospitals throughout the world, and has been used for many years by many of the well-known hospitals in England.

Dr. Paden says: "I consider somnoform the most valuable anesthetic for minor operations, from the rapidity of its induction, its length of available anesthesia, the possibility of administering it to all patients without special preparation, from its pleasant effects,

and from its safety, demonstrated not only by the investigations of its action on the nerve centers, but also a clean record of over 1,500,000 cases. In searching the medical and dental journals of this, as well as other countries, to secure the mortality of somnoform, I was unable to find an account of any. Later one journal contained an article by one of our nitrous oxid specialists, entitled, 'Nitrous Oxid vs. Somnoform.' He claims that three 'precious lives' have been lost through the use of this 'dangerous drug.' He did not give the mortality of nitrous oxid gas. One authority gives it as one to 25,000, while another gives it, 1 to 50,000. If these 1,500,000 patients had taken nitrous oxid in the place of somnoform, instead of three there would have been 30 or 60 precious lives lost.

"While I have used somnoform in less than 100 cases, as yet I have not had any but the best results in harmony with the experience mentioned in these notes.

"I feel convinced that it is the most desirable of all the anesthetics for use in dental practice.

"The conditions surrounding its administration are practically the same as obtain in the use of any other anesthetic: Perfect quiet and the use of every means to secure the full confidence of the patient."—*Dental Summary.*

THE PROBLEM OF ASEPTIC DENTISTRY. By W. Cass Grayston, L.D.S.I., Scarborough, England. In dealing with the subject of aseptic dentistry, I think I may fairly say that this is a child begotten of aseptic surgery, and but for the parent we should have heard nothing of the child. Aseptic surgery is cleanliness fully carried out in a scientific manner. The advantages of cleanliness as a preventive of infection have been known for many ages, and although the exact or original reasons for many ordinary or everyday precautions are unknown or not bothered about by those who observe them, they exist and are habitually practised by all refined members of society as part of a code of good manners or of ordinary decency of conduct. Such customs as objecting to drink out of another person's glass; the wiping of the edge of the loving-cup that is passed around; the disgust we should feel if a knife and fork that had been used by some one else were placed before us at a meal; the serviette rings that prevent our table napkins being mixed up, and the washing of hands before meals, are all part and parcel

of a knowledge—dim or unconscious though it may be—that disease is readily transmissible from one individual to another. But the ordinary exigencies of life bring it about that only limited precautions can be taken, except in special cases.

The carrying out of every possible precaution in all cases of risk is quite out of the question. Let us take consumption, for instance. The conclusion arrived at by one of the great congresses on tuberculosis, was that the family dwelling-house was far more important than the family tree, and this emphasizes the well-known health precaution of clean and well-ventilated houses. But the success of the open-air treatment warns us that if we would stamp out what has been described as one of the saddest and most prevalent of diseases, we must burn our cities, stop congregating in large masses, scatter ourselves widely over the land, and live and sleep in the open air. We are not likely to do this. We prefer to take life as we find it, and live and labor as best we can under existing conditions, rather than turn ourselves into wild men of the woods, for fear of a complaint we may never catch. There is a great deal of difference on the one hand, between giving up our ordinary lives, and on the other, taking such simple precaution as breathing as much fresh air as we can. The wisest of men go through life taking just such ordinary precautions as the usual or slight risks of the twenty-four hours of the day and night demand, reserving special precautions for special circumstances.

There is considerable difference between the circumstances and risks of surgical operations and the surroundings and risks of dental work. Antiseptic surgery and its successor, aseptic surgery, have not only reduced the risks of the earlier operations to a minimum, but have brought about the successful performance of many operations that were formerly far too risky to attempt. But there are no operations that a dentist ordinarily performs to-day that were too risky to undertake before the advent of aseptic surgery, and there are no ordinary dental operations performed to-day that depend for their success on such a complete observance of aseptic precautions as characterizes the work of our modern surgeons. Nor do the surroundings or circumstances of dental work lend themselves to such complete carrying out of asepsis. Let us take the case of a patient who is "mad with toothache," and in which extraction is the only remedy. Supposing the whole mouth is in a neglected and

filthy condition, would you advocate spending two or three weeks in removing tartar, treating abscesses, and doing anything else that might be necessary, in order to place that mouth in as aseptic a state as possible before you extracted the tooth? Would you do this and allow the patient to suffer agonies all this time? Would you keep him dosed with opium all this time or would you at once extract the tooth? I think you would at once extract the tooth and take the risk, trusting, of course, to whatever subsequent treatment seemed good. I think an immediate extraction would be advised at either a dental or a general hospital, where of all places the value of asepsis is fully recognized. You all know that deaths have occurred as the result of extraction under these conditions, but you know they are so rare that you would not consider it advisable to take the extraordinary and—under the circumstances—difficult precautions that would be necessary in order to perform as aseptic an operation as possible. If, however, an appreciable percentage of these cases either terminated fatally or gave rise to grave anxiety, we should feel compelled to change our usual practice in regard to them. Is it not possible for pus to be inhaled during the extraction of a number of teeth under ether with septic pneumonia as a probable sequel? If so, will the Howard method of operating with the head hanging over the edge of the table prevent or minimize this risk? Antiseptic and aseptic surgery have taught us much that we can utilize for our advantage and the advantage of our patients, but the difference between our work and the work of the surgeon warrants us in carrying out our aseptic precautions with "sweet reasonableness." Before the advent of asepsis there were clean dentists and dirty dentists. I knew a dentist in the olden days who so frequently neglected to wash or even wipe his forceps, that another practitioner said to me in his presence, "I believe he thinks he gets a better grip on a tooth if he leaves the muck on his instruments." I trust that the various papers that have been read on dental asepsis will at any rate cause all dirty dentists—if any such still exist—to mend their ways, but I am rather afraid that too much insistance on elaborate details may have an opposite effect and bring about a discouragement that will have its expression in a neglect of the more ordinary precautions.

I see no necessity for having our operating rooms in a more aseptic condition than the living rooms of our patients. Such things,

therefore, as a tiled or even a parquet flooring, tiled walls and ceiling, washable, unupholstered chairs and seats in general, and a surgically hygienic operating chair in particular, do not enter into my scheme. Nor do I insist on washable operating coats for purposes of asepsis. If washable coats are necessary why not washable waistcoats and trousers? I do not like to see a dentist with a long beard, but I would not advocate being clean shaven, especially when it comes to shaving the head. I do not know if anyone has suggested shaven heads, but this is certainly carrying personal asepsis to its logical conclusion, which, like many other logical conclusions, is absurd.

One of my patients, who is a chemist, noticed my sterilizing tank and began to talk about it. He said, "I thought it was only necessary for a dentist to sterilize his instruments if he had been working for a syphilitic patient." "Add to this," I replied, "all instruments that have come into contact with pus or foul and infectious tissue, and you are about right;" but it is the fashion to sterilize all our instruments now, and it is just as well to be on the safe side in any case. Still it does seem rather strange to sterilize instruments merely because they have been in the mouth, and then to know that our patients put spoons and forks in their mouths which have certainly not been sterilized between meals, or always used by the same individual. Even medical men, surgeons and dentists, take meals at hotels and restaurants with light hearts. Our own cooks stir up our food with a spoon they have just tasted it with to see if it is all right, and we do not concern ourselves very much about the sanitary state of our cook's mouth. It is an astonishing thing to me that an aseptic crank ever dares to ride in a cab or a railway carriage, not to speak of dining at a restaurant or keeping a cook. We are told that each patient should be given a clean tumbler, and, while admitting that an unclean tumbler is just as disagreeable to a patient as it would be to ourselves, at our own tables or at the table of an hotel or restaurant, I wonder if a tumbler that is merely cleaned in warm water and wiped with a cloth that has been used for other tumblers—which is the usual domestic method—is any better than instruments that have only been cleaned in the same way? If all instruments should be sterilized, why not tumblers? Why sterilize such an instrument as a mouth-mirror, for instance, and then give the patient an unsterilized tumbler to put to the lips for the purpose of rinsing out the mouth. I see no advantage in

jumping out of the way of a railway train to be crushed to death with a steam roller, so please tell me how to conveniently sterilize my tumblers.

It is not difficult to have extracting forceps and gags boiled after an operation. We are not using these things frequently and there is usually plenty of time. As for other instruments we may immerse them in some suitable solution. There was no solution that was any good at all for sterilizing instruments until it was found that boiling dulled or ruined cutting edges. Then various solutions formerly used only for keeping a boiled instrument in an aseptic state, suddenly took upon themselves wonderful sterilizing properties. Many of them ought to be excellent germicides, for they are nasty enough to scare away or bring sudden death to any self-respecting germs. Lysol makes your hands smell like a chemist's shop. Formalin roughens the hands and impairs the sense of touch. Lysoform in solution looks like old soap suds, it roughens the hands somewhat and leaves on them and on the instruments a persistent odor of cheap hair oil. You may take your foil carriers and pick the instruments out of the tank carefully and laboriously one by one. You may drop them in water before drying them with a cloth. You may waste a good deal of time in doing all this, with more or less satisfaction. Then you get rushed and you pick them out of the tank, as many as you can catch hold of at a time, with the foil carriers or tongs, drop them directly on to a cloth and wipe them as quickly as possible.

Some dentists get their waiting-maids to sterilize the instruments and thereby transfer the inconveniences of the proceeding to them. It is not everyone, however, who is fortunate enough to have a waiting-maid or attendant who will walk about with rough or "smelly" hands without complaining, and my experience of waiting-maids is that unless they are carefully watched they will wipe a sterilized instrument on a dirty dishcloth or anything that comes handy. You cannot instil into their minds the necessity for always taking care. If the clean cloth is not immediately at hand—of course it ought to be, but they do forget things so—up they grab any old rag, "it can't matter, and besides, he'll never know." So you see I think many of us will prefer to sterilize our instruments with our own hands. "If you want a thing done well, do it yourself."

I have read that in consequence of the disadvantage of boiling cutting instruments some American surgeons are immersing them in alcohol instead. I presume they use pure spirit of absolute alcohol, but I do not know how long they must remain in it before they are fit to use. In all probability the addition of a suitable essential oil to the alcohol would be an advantage for our purposes, not only for any increased germicidal action that might be produced, but also because a suitable oil will mask or do away with the disagreeable odor of methylated spirit, and the difference between the cost of methylated spirit and rectified spirits of wine—not to speak of absolute alcohol—is considerable. So if it can be proved that this is really efficacious, methylated spirit plus the oil would not be too expensive. I beg to refer those who may be interested in this to the *Dental Review* of August, 1898. In it appears a most instructive article by Dr. Peck on the antiseptic value of the essential oils and some other agents. From this it will be seen that three-tenths of a drop of oil of cassia will prevent the development of germs in 10 cc. of mouth-infected broth. This works out to one part in 2.233. Oil of cinnamon is antiseptic 1 in 2,100 parts; oil of cloves, 1 in 1,150. Compare these with eucalyptol, which took six drops, or 1 in 116 parts, also with eucalyptus oil which produced a restraining effect on the development of bacteria only when a saturated solution was produced with the bouillon. Carbolic acid was antiseptic, but not permanently so—1 in 338. Formalin was antiseptic 1 in 1,400.

It may come as a surprise to many to learn that formalin is a weaker antiseptic than the oils of cassia and cinnamon, but Dr. Miller's experiments in the sterilization of the mouth by washes prove that the most potent germicides do not necessarily act with the greatest rapidity, and in using a germicide or an antiseptic for any specific purpose, several things have to be taken into consideration. It must be borne in mind that Dr. Peck's experiments were made with the object of ascertaining the antiseptic effect of the smallest quantities of the agents tested, and not the germicidal effect. Still, we know that some of the essential oils are potent germicides, if used in sufficient strength, and it may be that an alcoholic solution of a suitable oil will serve our purpose for sterilizing instruments. I have been using such a preparation in the proportion of 5 parts of the oil to 100 parts of methylated spirit and it does not possess the

disagreeable properties of the fluids I have criticized. In order to prevent the instruments rusting, I add soap. I shall be greatly comforted if I am able to ascertain that this mixture of spirit, essential oil and soap, is really efficacious.

One of the finest germ collectors in the operating room is the indispensable nail-brush. It has been suggested that it should be kept in a solution of carbolic acid, but the bristles of the nail-brush provide so many hidden lairs or lurking places for the wily microbe, that I think it would take a pretty strong solution to reach him and kill him dead. I have no desire to murder microbes and skin my fingers at the same time. Such a proceeding as screwing a ring into the back of the brush, picking it carefully out of the solution with a bit of bent wire and then splashing it around in the wash-hand basin until the carbolic is washed away is interesting, but complicated. I am a simple-minded man, and complexities worry me.

It is hardly necessary to allude to the advantages of having a wash-hand-basin with hot and cold water in the operating room. Washing the hands before attending to a patient is an act of ordinary personal cleanliness that should be expected, but I do not think anyone has gone so far as to suggest that the hands should be washed every time we withdraw them from a patient's mouth to take a bottle out of the medicine cupboard or cut off a piece of rubber dam, or break off a piece of floss silk, or stop to blow our noses, and yet, if it is necessary to sterilize an instrument merely because it has been in the mouth, it is surely necessary to stop and wash our hands frequently in order to avoid as far as possible a scattering of germs on everything we handle that cannot be easily and conveniently sterilized between patient's visits. If we do not do this we shall surely convey more germs from one mouth to another by means of our fingers than by means of instruments that have been washed in soap and water. If we spend half our time in washing our hands, many patients will think it goes down in the bill, and if we are careful to explain all about germs they may consider that a visit to the dentist is not only an unpleasant but a very risky thing. I flatter myself I wash my hands as frequently as any dentist does, but how I am to wash them often enough and get through my work in a reasonable time I do not know. I suppose I shall have to stop work the next time I have a cold in my nose, or suspend a hook from the ceiling and hang a fresh pocket-handkerchief

onto it before attending to each patient, for, of course, I must not fill up my pocket with one patient's germs and empty it into another patient's mouth by means of my fingers.

I do not see any advantage in substituting metal rings for the knobs of our cabinet drawers. A knob is easier to clean than a ring and if you are very particular you can open the drawers quite as easily and quickly with a pair of foil carriers as by sticking an instrument through a ring, and what is more important, the instruments can be taken from the drawer with the foil carriers in preference to fouling several other instruments with your fingers. There is no such thing as an aseptic dental cabinet, just as there is no such thing as an aseptic dental operating room. I do not care for the make-believe of rounded corners to the drawers and wiping them out with an antiseptic every now and then. You can make an instrument cabinet practically aseptic by having glass, porcelain or metal dishes made to fit the drawers and keeping sufficient antiseptic fluid in the dishes to cover the instruments. I hope some of the more enthusiastic will try this and let us know if it is attended by any grave inconveniences or not.

Have the bottoms of all the drawers perforated and some powerful and vaporizable germicide in a dish over a lamp or flame in the lowest compartment. You will probably have to shut your eyes and hold your nose whenever you open this cabinet to get anything out of it, but this is a mere detail. Is it necessary, however, to sterilize cotton wool, floss silk, polishing discs and strips and other things that are never used twice? If so, is there any means of accomplishing it easily and quickly, for we must have a little time in which to try and earn our livings?

Something has been said about the advantages of smooth handles for our instruments, and file-cut and gnarled handles have been deprecated. With the exception, perhaps, of extracting forceps, smooth handles do possess certain advantages. They are much easier to keep bright with a polishing powder, but if we can sterilize engine burs and pulp extractors I do not think we need worry about serrated handles as far as rendering them aseptic is concerned.

I do not suppose that many dentists who have gone to considerable expense in fitting up their operating rooms in a convenient, but a somewhat dust-collecting manner, will care to refurnish for purposes of asepsis, and I have pointed out that an operating room

that is as clean as an average well kept living room cannot be considered a menace to a patient's health. It is just as well, however, for a dentist who is thinking about the furnishing and arrangements of an operating room to realize the advantages of cabinets, writing desks, etc., that can be easily swept underneath. I think it is distinctly preferable for the legs to be on casters and for the pieces of furniture to be light enough for easy movement. This will enable them to be dusted or cleaned all round. A dental cabinet is usually so large, or has such an amount of instruments and other things in it, that it is only laboriously moved once a year when the spring cleaning takes place. It is better to distribute our instruments, etc., among two or three easily movable cabinets.

I consider a wash-hand-basin that is bracketed to the wall is better than one that is boxed up with a cabinet or cupboard arrangement, particularly if the cupboard goes down to the ground. Of course, you may say this is only part of a scheme of general cleanliness that should be carried out until carpets, curtains, upholstered seats, and particularly an upholstered operating chair, are banished from our surgeries. But I have already said that I would not go so far as this. Still, anyone who has been a householder for some time knows that in the housemaid's catechism a corner is the place to sweep dust into. The corners of the room itself provide ample scope for energy in this direction, and it is therefore unnecessary, not to say inadvisable, to provide extra corners.

Ordinary cleanliness, fresh air and sunshine, are excellent antiseptics. As far as sunshine is concerned, a glaring light is bad for our comfort and our eyesight. I have never worked in a room with a south aspect, and am therefore unable to say anything about this light. I have had considerable experience of west and north aspects, and now have an east light, which I much prefer. I think that sunshine should be considered as a by no means unimportant factor in dental asepsis, though of course it should not be used to the detriment of comfort or a good working light.

I am afraid you will think that I have tried to minimize the importance of certain aseptic precautions. You may even accuse me of attempting to poke fun at some of them. This is not my intention. I recognize, however, that the ideal is ever subservient to the practicable. Reasonable precautions are all that can be expected of us, as they are all we expect and receive from others. There is no

reason why anyone should be so overwhelmed by the impossibility of complete dental asepsis that he neglects all obvious precautions. But it is distinctly unwise for time to be wasted on non-essentials to the detriment of essentials. What is necessary and practicable, and what is either unnecessary or impracticable, can only be determined by much free discussion, the acquirement of more knowledge and the use of the fine sieve of common sense. There is a great deal of difference between the man who takes care of his health and the one who feels sure that it is an awfully dangerous thing to be alive. There was a time when merely dipping an instrument in a weak solution of carbolic was deemed sufficient; now we know this is almost useless. Not so very long ago a boiling of from three to five minutes was the correct time for surgical instruments. Now twenty minutes is, I believe, the minimum time.

All sorts of statements are made as to the germicidal value of certain solutions, but we want "chapter and verse" for all this. We want to know the minimum strength in which a solution is germicidal and the minimum time in which it acts. We want to know how many instruments, or if there is any limit to the number that may be placed at a time in a given quantity of the liquid, and how often we must renew the solutions. We want the best available solution for our purposes, and we want to know all about it. We want to know if we are really practicing asepsis as well as we can. Scraps of valuable information come our way as well as dogmatic statements that are either all wrong or yet to be proved.

I will conclude with two little stories or anecdotes, and for fear someone should bring an action for libel against me, I will say that I relate them without prejudice. When I was a little boy at school another small boy said to me, "Do you wash your face in the same water you have used for your hands?" I said, "Yes." "I never do that," he replied; "you must be a dirty beast." I said nothing; but when the cold days of winter arrived I noticed that although he had washed his face, his neck was innocent of soap and water. Again I said nothing, but I thought a lot. I was watching a demonstration of anesthetics, and the dentist who was about to extract the teeth had his forceps hanging on the breast pocket of his coat. A younger dentist sitting next to me noticed this and said, "If a student at the Dental Hospital were to do that they would kick him out." "I suppose they are very particular there?" I replied. "How do they

sterilize their forceps?" "In a big tank that is always full of boiling water," was the answer. Then I said, "I suppose between each operation they are put back into the tank for twenty minutes?" "Oh, no," he replied; "there isn't time for that." "For five minutes, then?" I suggested. "There's too much work to get through for that," he said. "What is done with them?" I gasped. "Oh, the beaks are dipped in the boiling water or in a solution of carbolic, and wiped." "But that will not sterilize them!" I exclaimed. "I know that," he said; "but it is better than nothing." The moral is, that what is convenient is carried out, and what is inconvenient is neglected. I plead for a knowledge of how to carry out dental asepsis with the least inconvenience, and, consequently, the greatest real thoroughness.—*British Dental Journal.*

A METHOD OF ANCHORING BRIDGES BY SWAGED INLAID ABUTMENTS. By Joseph W. Wassall, M.D., D.D.S., Chicago, Ill. That the conventional method of making artificial crowns with bands telescoping over roots or broken-down teeth is unsound practice has long been recognized by both the profession and laity. While under favorable conditions good and safe results are obtainable, insufficiency of coaptation of band edge and tooth cervix is of such frequent occurrence that it constitutes a serious defect and calls for a change of method. It is a fault observed in the application of crowns to restore lost dental tissue as well as when employed for bridge abutments.

The normal anatomical formation of bicuspids and molars constitutes a natural and the most serious bar to the perfect fitting of a band. An examination of typical tooth forms gives instant conviction of the irrationality and impossibility of attempting accurate and scientific coaptation at the tooth's neck, at once the most important and vulnerable point. It is all too evident that the almost universal custom of procedure is based on wrong mechanical principles and produces unhygienic, unsanitary and disease-engendering conditions.

Flagrant violations of all the laws of dental hygienics and mechanics constantly come into our hands as crown work. There is not a dentist but can recall specimens which he has had occasion to remove which bring the blush of shame for the inefficiency, to

use a mild term, of the profession, and the worst offenders are not always men unknown to dental fame. It is a rare thing indeed to find a shell or banded crown with a perfectly fitted joint. This, it is plain, is not so much the fault of the man as of the method. The reasons therefor depend upon the very nature of the anatomical conditions which are present.

What is the history of the shell or banded crown used either as a crown or abutment? Some portion of its border stands away from the cervix, as I have said before—a condition usually impossible to avoid. The gingivitus is there subject to irritation both from the sharp metallic edge and the decomposing secretion or debris lodged beneath it. The free gum margin will, therefore, be irritated and become congested more or less, presenting inflammatory conditions, varying in intensity from slight redness to severe and dangerous purulent pyorrheic inflammation. The subjective effects of such a condition may be tenderness or positive pain, tendency to hemorrhage, true pyorrhea, formation of pockets, occasional abscess, etc. In many cases caries of the cervix or crown or root supervenes, encouraged both by the lodgment of debris in the overhand or in the cul de sac, formed by the disintegration and loss of cement from beneath the band. Pulp pain and neuralgia may now be a complication. The situation is aggravated by a growing reluctance to the use of the brush, or disuse in mastication, followed by a constant increase in severity of all the malign conditions above enumerated. If the progress of such influences is not checked, the tooth is greatly impaired or lost, either from caries, pyorrhea, or both. This is the true clinical picture presented by a severe case, and unfortunately it is not an uncommon experience. Does not a practice which brings forth such malign results cry out for remedy?

The substitute I have to offer for the old method is a crown inset into the substance of the tooth, the gold margin of which is flush with the tooth's surface. This method has been in use in my office as routine practice for some time, and is a development and outgrowth of the swaged gold inlay method of tooth filling, being a more extended application of gold inlay work. Such a covering seems to furnish a tenaciously adhering attachment even when the natural tooth is much wasted and broken down by caries. Indeed,

it is a constant surprise how securely such a covering seats itself and is retained.

There is no longer any necessity of extending the margin of a crown beneath the gum margin of bicuspids and molars. This alone is a great gain in permanency of operation, promoter of hygiene, comfort to the patient during procedures and ease to the operator. The new crown is in reality an "inlayed" crown, so far as its marginal coaptation is concerned. The continuity between tooth surface and gold crown, i. e., the gold being flush with the tooth surface, without any overlapping gold band, is the ideal condition in all tooth crowns. This is the essential feature of the method. It should be understood that there is also perfect coaptation of metal to tooth over all covered surface.

A great advantage in the method is the opportunity it affords of avoiding destruction of sound tissue. It enables one to construct a partial crown and to restore teeth which are much broken down by allowing the inlaid crown to embrace two or three sides of the tooth only, where by the old method the whole tooth being covered, greater tissue sacrifice was required. This is particularly useful when the bridge abutment is being made.

It may be described under two separate processes—first, the preparation or shaping of the tooth with the taking of impressions, and, second, the making of the crown from the impressions in the laboratory. The ultimate setting of the crown needs no description.

In the preparation of the tooth we have to deal with two classes of cases—the tooth which requires a crown for its own conservation, which, of course, presents a tooth greatly impaired by caries, and the case of a molar or bicuspid, which is to be covered to serve as a bridge abutment. The latter we will assume to be perfect, for the sake of description, but this is rarely the fact, for usually fillings more or less extensive are present, which simplify the work.

In the mouths of patients highly susceptible to pain very sensitive teeth may have pulps removed. This, however, is permissible only in matured teeth. Such devitalization is rarely required in actual practice, although quite justifiable when indicated by the conditions.

As the crown is to be made entirely in the laboratory from impressions, the preparation should proceed with the end in view that an impression is to be taken. The tooth is first shortened by removing with engine stones one-third of its occlusal end. Thin disks

in the straight handpiece are now employed to remove the mesial and distal surfaces, and similar disks and saucer-shaped stones in a right-angled handpiece are used to reduce the buccal and lingual surfaces, as well as the remaining sharp angles. A sharp shoulder approximately one line in width is left at or near the cervix, preferably just short of it, against which the finished crown is to coapt flush. All sides are to be well beveled or converged to the occlusal end. In cases where extensive loss of tissue has already occurred the judgment of the operator will retain and shape properly the remaining portions along the lines above set forth. It should be remembered, however, that an astonishing deal of retentive power exists in even slight projections, depressions and irregularities of surface when exactly and closely covered by an accurately fitting cope in the manner to be described later.

If, however, there is evidence of insufficient anchorage, provision for from one to three posts in the canals may now be provided for.

In the application of this form of crown to bridge attachment, where a sound tooth is to be utilized, the entire buccal portion of the tooth, including buccal cusps, is preserved. The preparation is along the following lines. The shortening is confined to the lingual half of the occlusal surface, including the lingual cusps. The surface is ground to a step at right angle to the tooth's long axis. With a small thin wheel a groove is now ground mesio-distally in the center of the occlusal surface one line in depth. This groove is now carried over on to both the mesial and distal surfaces with fissure burs almost to the cervix. Let the lingual surface be now ground away leaving a shoulder near the cervix in the manner before described and extending on to the groove already made on both mesial and distal surfaces. The result will be a mechanically perfect means of attachment without the objectionable features of the old method of making a so-called open face crown with overlapping margins under the gum and on proximal surfaces.

The next step is the taking of impressions. First, we take an ordinary bite in modeling compound for a guide to occlusion. Second, we take an impression of the prepared tooth, together with adjoining teeth on either side, in a small tray, with modeling compound, as a guide in reproducing contour. Third, an accurate impression in Detroit Perfection Modeling Compound is taken of the

entire prepared tooth, from which the model is obtained upon which to make the cope.

The occlusion and contour impressions are obtained in the usual simple manner. The impression for the cast of the prepared tooth, however, must be true and accurate, which is not a difficult matter. An impression cup is made consisting of a copper band very loosely fitted to the tooth to be crowned, the edge being trimmed to conform to the alveolar border. The copper band is made one-quarter of an inch longer than the projecting tooth crown, and is filled with softened Detroit Modeling Compound and pressed over the tooth crown until the edge of the copper ring reaches the gum. Chilled with cold water, it is removed, and if properly done, a sharp impression of the entire crown, showing the shoulder well defined, will be the result.

The three impressions now go into a box with the patient's name and a date of the next appointment marked on the cover. This goes to the laboratory and is there completed, the patient not being seen again until it is to be set, or used for a bridge abutment. It will be evident that much time and inconvenience are saved to the patient by not having the matrix conformed directly to the prepared tooth. The operator also, if a busy man, may delegate this work to a laboratory assistant or do it himself at his greater leisure.

The laboratory process is as follows: The Detroit Perfection Compound impression is invested in a pad of soft plaster, which is trimmed when partly hard, to a square measuring about one and one-half inches. The redundant compound and plaster are trimmed away so as to show more clearly the margins to which the crown is to curve. The trimmed impression and plaster are rubbed with pure talcum powder, blowing out the surplus.

Ames' Brown Crown and Bridge Cement is slowly and thoroughly mixed to the same consistency as for a filling. The soft putty-like mass of cement is rolled in talcum and pressed over the impression. Sufficient force must be used to make it conform to all the inequalities, producing a strong perfect cast or model of the original. The cement-covered impression is submerged in cold water and left to harden, requiring about twenty minutes. To separate the compound impression and cement model it is well to submerge them for a few minutes in hot water, when a knife will

very easily pry them apart. The cement model just obtained is invested with plaster in a steel cup called a bed plate, the surplus plaster, when hard, being trimmed off flush with the edge of bed plate. A small piece of wet cotton is placed on the cement model, to remain at least an hour, to satisfy the crystallization requirements of a hydraulic cement, and thereby obtain the maximum strength for model which with ordinary care in working is quite sufficient to withstand the force necessary in getting accurate and certain results.

Either platinum foil 1-1000 thick or gold foil No. 120 may be used for the matrix. I prefer to use the platinum foil, partly swaging it to place over the model, using cotton held in a pair of foil carriers. With the cotton in place, the bed plate and foil are placed in the screw press water-bag swager and partly swaged to place. The foil is annealed perfectly under a blowpipe and swaged this time without using cotton, the untrimmed foil is again annealed and temporarily put aside. A piece of well-annealed virgin platinum plate, gauge 38, is swaged and adapted over the same cement model, being particularly careful to have the metal slightly overlap the line the flush or inlayed crown is to cover. The partly swaged foil is again placed on the cement model and finally swaged to place, after which the adapted and trimmed platinum plate is put over the foil and both swaged.

Both foil and plate are removed and flushed between with 22-karat gold solder, the surplus foil being trimmed off. This leaves a perfectly adapted metal cope sufficiently stiffened and rigid to handle in taking the bite for use in building on a tip for occlusion and contour. This cope will be a perfect fit, providing, of course, that everything has been done according to the laws of mechanics.

The bite which is taken is poured in plaster, separated and trimmed; a small piece of softened modeling compound is molded over the metal cope and the bite pressed into it for occlusion, after which characteristic grooves, fissures and cusps are carved. A Mellotte's metal die and counter die are made from carved tip, a gold tip swaged, which is waxed to the cope, invested and soldered with 20-karat gold solder, which allows for any patching with 18-karat gold solder that may be necessary. The polishing is done in the usual way, except the margins, which are worked down to with

a fine file to prevent polishing beyond the finished line. Rapidly revolving stones are much more uncertain and harder to control.—*Dental Review.*

A HIGHER IDEAL IN CROWN AND BRIDGE WORK. By A. Percival Burkhardt, M.D.S., Buffalo, N. Y. At the leading dental meetings which I have attended for several years past there has been a marked absence of discussion of crown and bridge work. I regret exceedingly that so important a branch in dentistry has been overshadowed by porcelain and gold inlay work.

Inlay work has it merits and I shall not condemn it, because I believe in it when used with judgment. Crown and bridge work, however, has been tested for a sufficient length of time to judge whether it is worthy the attention of the dental profession. But one answer can be given, and that in the affirmative. Dr. George Evans, in his latest work, says: "Modern artificial crown and bridge work belongs to the department of dentistry formerly termed 'mechanical,' but the judgment, skill, and scientific information required place it far above ordinary mechanical dentistry, which has sunk to a low estate since the introduction of vulcanite."

In this paper I refer entirely to that particular branch of crown and bridge work known as fixed or stationary bridge work, although in my daily practice I do not confine myself to this particular style altogether. Conditions must, of necessity, determine each case. Removable crown and bridge work is a valuable adjunct, and oftentimes is the only artistic and useful work to construct. In a spirit of enthusiasm, I venture to say that crown and bridge work, when honestly recommended, and properly and artistically constructed, is a credit to the skillful practitioner; a blessing and comfort to patients. The interests of the patient should be the guiding principle in all our operations, and, after careful examination, plainly and distinctly indicate to him the best system suited to his case. To arrive at an opinion, the mechanical portion of the operation is not the only element to be considered. Pathology and therapeutics must not be overlooked if we mean to treat our patients as we would like to be treated, were we undergoing a similar operation. To arrive at a safe conclusion the same care should be exercised as the skilled orthodontist pursues; namely, the obtaining of an accurate model of

each jaw, and occluding them for careful study. Plaster models afford an opportunity for studying restoration of features and tooth structure, and correct occlusion of the intended artificial, with the natural organs.

Crown and bridge work has its dark sides, because, too frequently, by unscrupulous and avaricious men, it is employed when other means to a certainty are indicated. This branch has been, and is daily being abused, more than any other in dentistry, and I therefore believe it the duty of every honest and skillful practitioner, by word and act, to aid in elevating it to a higher plane.

You may ask, "How is this branch so grossly abused?" My answer is, by faulty and carelessly constructed work which fails often to bear the stamp of honesty. This is inserted in the mouths of patients and by them accepted, because they are unable to note the faulty construction, broken and checked porcelain pin facings or to detect ill-fitting caps and shell crowns.

A dentist who will insert a single crown or bridge upon an inaccurately prepared abutment, or abutments, and depend almost wholly upon the cement to keep the crown or bridge in position, is not honest. Honesty toward patients, conscientiously prepared abutments, accurately fitted caps to abutments, the very best materials, artistically constructed work, and humane treatment, are some of the requisites which should govern every dentist.

Too frequently we hear youthful dentists say: "Oh, I am an expert crown and bridge worker." With due respect to youth and ambition, in all kindness let me say, it takes more than a month, or a year, to become an expert. To insure the highest degree of success, to mechanical skill must be added daily experience, pathological consideration and therapeutics, and the combination of these factors leads to success in crown and bridge work.

The habit so prevalent in the dental profession of employing dental laboratories almost exclusively is not conducive to the attainment of skill and experience, especially among the younger element of the profession.

Having carefully fixed in my mind the crown and bridge I desire to construct, I proceed quickly and as painlessly as possible to the reduction of tooth substance, having in view the proper shaping of an abutment, or abutments. Much valuable time may be saved, and the operation shortened, by adjusting, whenever possible and prac-

ticable, the rubber dam over the teeth to be reduced. Here is one of the places where humane treatment is indicated. Therefore, previous to the adjustment of the rubber dam, treat the margins of the gums surrounding the necks of the teeth with cocain. In this way the rubber dam clamp and ligature can be deeply depressed around the necks of the teeth and thereby the greatest possible exposure be obtained for the rapid reduction of tooth structure, insuring the more accurate preparation of the abutment. Teeth thus protected and free from saliva afford superior opportunities for rapid work and accurate shaping of abutments. This method will be found particularly useful in locating Logan, Davis, Twentieth Century, White's, or any other make of porcelain crowns on the six anterior teeth. While thus reducing tooth structure, compressed air becomes a factor for humane treatment. My assistant directs a stream of cold air, thus preventing the overheating of the tooth being operated on. I do not want it understood that I use the rubber dam in all cases. Circumstances govern. For the reduction of tooth substance, I use knife-edge carborundum wheels of varying sizes made by Lee Smith & Son. With the sharp knife-edge, slice the bulging portions of bicuspids and molars on anterior and posterior approximal surfaces, and likewise on labial and lingual sides, and this done, the crowns will be almost in the form of a square. Next carry the now blunted disks backward and forward lightly over the occlusal surface, thus avoiding long-continued pressure and undue friction on one spot. This class of disks will do away with the severe jarring which a coarse stump wheel produces on the nerves of patients.

Having reduced the sides, and occlusal surfaces of the tooth, with sandpaper disks complete the final shaping and polishing of the abutment. The occlusal surface of bicuspid or molar should be as near level as an accurate eye and skilled hand can produce. Uneven surfaces, or pivoted points on occlusal surfaces, are factors in loosening of single crowns, and even bridges.

One of the great sources of failure in crown and bridge work is the defective and slovenly prepared abutment. If the teeth are absolutely too painful for patient to bear, then by all means use pressure anesthesia to reduce sensitiveness, and then the abutment can be accurately shaped. If an abutment requires filling, avoid cements; use a hard, quick-setting amalgam, and when thoroughly hardened, complete with nicety the abutment.

After the preparation of the abutments, the next step is to construct Richmond or shell crowns and dummies, but I shall not attempt to discuss their technique, only so far as one is concerned. I allude to bicuspid shell crowns, and under certain conditions sometimes a cuspid shell crown. To avoid a large display of gold, I have for some years frequently employed pure platinum for this class of crowns, the body or barrel portion platinum, and the cusps struck up out of pure gold and properly reinforced. The eye catches the gold cusp which appears like a filling, and the platinum being of a lighter or grayish shade, is hardly observed.

In the construction of the Richmond crowns, or any crown requiring a pin facing, the greatest care must be exercised to have the porcelain pins and backing absolutely clean, and if the porcelain has been ground, those parts should be thoroughly polished. I believe it bad practice to bend the pins, clamping them on the backing, because it strains the porcelain.

In building a bridge my rule is to construct each tooth, or dummy, by itself. This done I assemble all in proper position on the articulating model, leaving for final soldering the joints between parts only, and thus with a small quantity of solder, the bridge is completed, and the expansion and contraction incident to soldering reduced to a minimum. This process takes a little more time, but it produces more satisfactory results.

For purposes of greater accuracy, all abutment pieces should be steadied, before taking bite and impression, by coating inside of caps with wax, and when seated thoroughly, chilling them. After taking the impression, boil out the wax in the caps, and then while running sump model, place in each abutment cap perpendicularly a good sized carpet tack, and complete the model. In case of breakage, the tacks remaining in the main portion of the model become guides to accuracy in the replacement of broken parts.

The most unsightly bridges which have come to my notice are large, upper arch bridges usually located on the two cuspids and molars. To produce artistic results in this class of bridges, I have adopted the following method. With all caps steadied on the abutments, the bite is procured and followed by an accurate plaster impression. I remove the wax from molar caps, but leave a slight amount in the cuspid caps and around the pins and then run a sump model, and when hard, prepare and place same on articulator.

After removing the wax bite, I solder a platinoid or gold bar to the posterior portion of the cuspid caps extending from cap to cap. While soldering, the wax in the caps and pins will disappear, and with a little force caps and bar will come off together. On the model and directly under the bar, and between the two caps, I burnish some tea lead to prevent wax from adhering to the model, and return caps to position. Next, I select six anterior plain teeth, such as are used in rubber work, and wax them to caps and bar, thus forming a trial case. When arranged, I try them in the patient's mouth and on this trial plate by trying and fitting secure correct length and width of teeth, proper shade, and the general expression well studied; then the selection of proper facings becomes an easy matter. Next, I remove the trial teeth on the cuspid caps, and proceed to grind and fit the two facings; back the facings, wax to caps, after carefully articulating same, then remove from the bar the four incisor trial teeth and wax. Now I take from the model the two waxed cuspids, invest and with solder finish the backing to contour, and when cool remove from investment, saw off the bar from each cuspid, shape and finish and return to model and then the assembling of the incisors becomes easy, because the cuspids become accurate guides, as they have been previously tested, and along lines which permit of no mistake. A bridge constructed in this manner will not be an unsightly affair. This method eliminates all guess work.

Indifference and slovenly methods used in investing crowns and bridges produce too frequently unsatisfactory fitting bridges, and result in broken and checked facings. The habit of pushing a case into a soft, moving mass of investment, which, in turn, rests on an uneven or soft surface, such as blotting paper, or even common paper, is bad practice. Proper sized boxes, from the ordinary sandpaper disk boxes to well selected larger sizes, should be used. The boxes filled about two-thirds with investment material will hold firmly, and securely encase every line and crevice of the invested bridge or crown. Save your sandpaper disk boxes; they are useful when investing a single crown, or small bridge.

Pin facings are our greatest source of annoyance. After we have put forth our best and most skillful efforts, a bridge comes from the investment with one or more checked, or even broken facings, and the sensitive and conscientious man becomes sick at heart. The pin

facings so largely employed are, with slight improvement, the same we have used for years in the production of artificial teeth placed on gold and silver plates. They may do for the latter work, but are undesirable for crown and bridge work, where of necessity many times extremely large quantities of plate and gold solder are used. While this defect is well recognized, there is still another. Pin facings are not properly proportioned. They are usually too narrow at the neck, as compared with the incisal edge, and as a result, unsightly V-shaped spaces between the teeth result when the case is completed. It would seem that the manufacturers could correct at least this one very glaring defect.

Naturally, the question arises, is there any product which overcomes the defects in pin facings? If there is, the facing must be detachable, and interchangeable, consequently subjected to no heat at all during the process of soldering. Also the facings must be of proper proportions, wider at the neck, thus overcoming the unsightly V-shaped open spaces to which I have called your attention.

Always on the lookout to take advantage of every improvement and advance in dentistry, I hailed with delight the Mason facings, when they were placed on the market. It was a product never fully appreciated by the profession. Since the introduction of the Mason facings, advances have been made in the production of detachable facings, and among the advances, I allude to the Steele facings, made at Columbus, Ohio. Two years ago I began using these facings, and with very satisfactory results. I now never worry over checked facings, nor broken facings.

With the lapse of time I have no doubt that American brain and enterprise will surpass even the product named, but until that time arrives, the Steele facings offer to the artistically inclined bridge worker advantages which he cannot pass by consistently. Stop and think for a moment what it means to be able to use a facing which does not receive the heat incident to the soldering process. You will realize that it means no discoloration of facings, and a bridge when completed absolutely free from checked and broken facings, unsightly gold tips, with no display of gold between facings. Again, bridges can be inserted almost immediately after extraction, and later, when absorption of the gums has taken place the facings can be replaced with longer ones without removal of bridge. Time

is saved in the construction of bridges, and if repairs are ever needed, they can be made easily and quickly.

Sometimes dentists have said to me, "I prefer to use pin facings because they are cheaper than interchangeable ones." The dentist who reasons thus makes a mistake, and the quicker he divests himself of the idea of the cheapness, when constructing crown and bridge work, the better for him. I think that the very best materials should be used by every dentist. He thereby places himself on a higher plane, and has the conscious satisfaction of having given to his patient the best that money could buy, and he in turn will be justified in demanding a fee somewhere near commensurate with his best efforts and expenditures.

While pin facings have been a source of annoyance, many times, misfortunes from another source have come to me. I refer to the cements used in the cementation of bridges. During many years the cementation of crowns and bridges has been with me a subject of close study, and many times I have wished I might with ease remove a crown or bridge. To remove a bridge when one or two abutments ache or a cap is loose means tremendous labor, particularly if it includes one or more Richmond crowns. The conditions mentioned have confronted nearly every dentist, whether of limited or extensive experience. Many valuable abutments are destroyed because of the difficulty attending the timely removal of bridges set with crystal cements. For single crowns on anterior roots I employ guttapercha, and with most excellent results, but for bridges up to about three years ago I continued using the ordinary crystal cements. Three years ago I began using Evans's guttapercha cement for setting bridges, using it cautiously at first, but now I use it almost exclusively. As a result of my observation and experience, I now find myself in a position to remove a bridge easily and quickly without injury to an abutment. I now make it a rule to instruct my patients to return for an examination twice each year, and if dangerous symptoms present themselves, I remove the bridge and perform such services as will best benefit my patient. Had I used the cement named earlier in my practice, and observed the rules I now do, I am sure numerous valuable abutments which were lost would now be in a good state of preservation.—*Items of Interest.*

EXTRACTING IMPACTED LOWER THIRD MOLARS.

By W. T. Chalmers, D.D.S., Denver, Colo. A satisfactory method of extracting impacted lower third molars will probably never be found. To remove them without injury to the second molar and adjacent tissues remains a difficult operation. Fully twelve years ago Dr. Slonaker, of Chicago, advised devitalization of the third, and by diamond disks or stones cutting off part of the crown, which would permit the remainder of tooth to come forward toward the second molar, the amount of crown removed determining the distance. Those who have attempted the use of disks and stones for

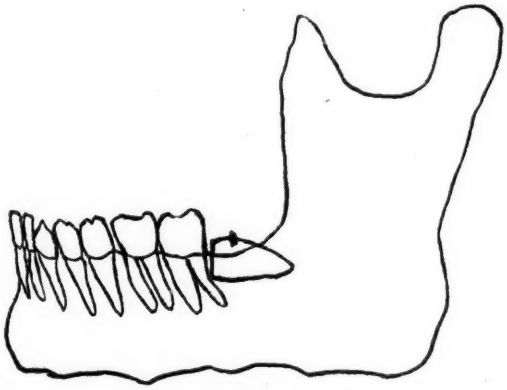


Fig. 1.

this purpose have found how difficult it is to use them of sufficient diameter to cut the crown of the third molar and at the same time not lacerate the cheek and tongue. If the crown of the second molar is long, or standing much above the third, the difficulty is increased, as the diameter of the stone or diamond disk must be increased to reach the third molar.

During the past year several have been removed in the following manner: With a sharp-edged stone or diamond disk, the enamel of the exposed portion of the crown of the third molar is penetrated to the dentin (Fig. 1). With a spear-headed drill in the contra-angle handpiece a small cavity is made in the dentin. Larger drills are now substituted until a good-sized cavity is secured, depending upon the sensibility of the tooth (Fig. 2). The object is to get a cavity that will enable the operator to apply arsenic, and seal it

securely, without danger of getting the preparation on the surrounding tissue, which so frequently almost covers this class of teeth. The patient can assist the operator greatly in holding cot-

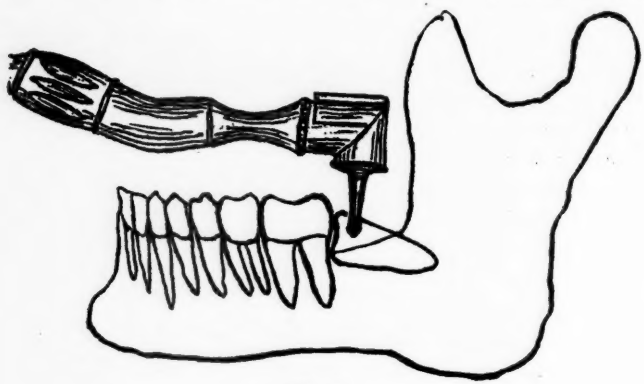


Fig. 2.

tonoid to depress the tongue, and with everything in readiness the devitalizing agent can be placed and sealed with cement. In five or six days the crown or a large part of it can be removed with burs.

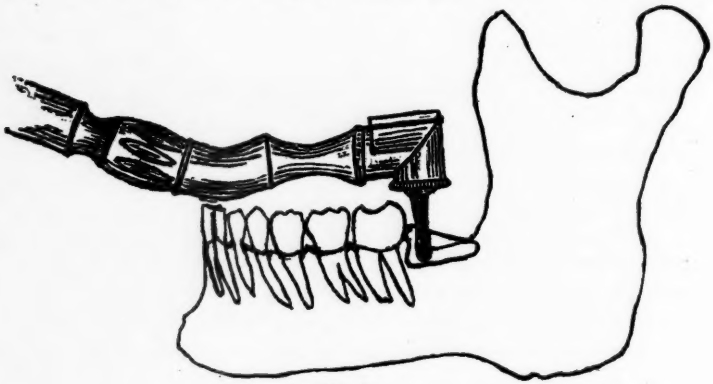


Fig. 3.

Instead of attempting to cut through the enamel at once the dentin is removed the width of the bur, so we have a groove extending entirely through the dentin, leaving only the buccal and lingual walls and what would be the mesial wall of enamel, if the tooth were in

its proper position (Fig. 3). This much can be accomplished without the slightest pain. With sharp fissure burs the buccal and lingual enamel walls now may be cut (Fig. 4), and unless the burs are permitted to slip and plunge into the soft tissues the operation is not a severe one in any way. The fissure burs seem specially indicated for cutting the enamel walls on account of the long cutting surfaces and the power of the operator to control them. By placing one of these burs in the cavity or groove with the head of contra-angle handpiece slightly inclined toward the cheek, the

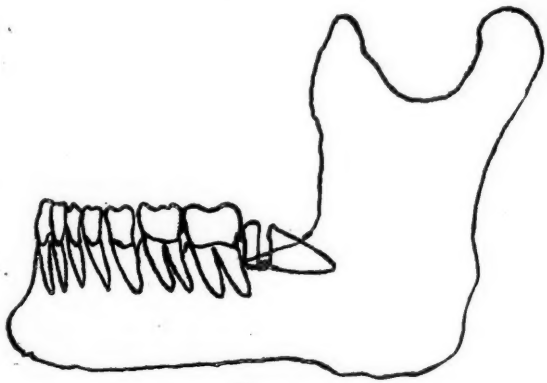


Fig. 4.

buccal enamel wall may be cut with little liability of the instrument slipping. In cutting the lingual wall the head of handpiece should be inclined toward the tongue. If it is impossible to separate the section of crown completely by this method of cutting, the remaining mesial wall can be broken by an elevator as soon as the patient is under an anesthetic. This portion of crown removed permits the moving forward and upward of the remainder of the tooth.—*Dental Review.*

ORAL SEPSIS.—In a healthy mouth pathogenic organisms may meet with a peaceful end; in the diseased mouth propagation is provided for and a larger dose is prepared for entrance to the body by the lungs, the stomach or the lymphatics. * * * There seem to be two dangers which may arise in connection with a septic mouth. First, infection, sometimes by direct extension; secondly, systemic poisoning by absorption and autointoxication.—SIDNEY SPOKES, *The Dental Record.*

The Dental Digest.

PUBLISHED THE LAST WEEK OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

BETTER SOCIETY ORGANIZATION.

The article on this subject which appeared in the December Digest has attracted considerable attention throughout the country, as evidenced by letters received, and we believe the time is close at hand when there will be a general reorganization of our state societies. In fact, this time seems to have arrived, for Iowa, Missouri, Wisconsin, Michigan and Southern California have already undertaken the work on plans similar to those carried out in Illinois, and the secretary of the Illinois State Dental Society has received letters from Vermont, Pennsylvania, Ohio, North Carolina, Indiana, Kentucky, Mississippi, Kansas, Nebraska, Minnesota, Colorado, Texas, Oklahoma, Florida and other states which have the adoption of such a plan under consideration.

It is probable that the total membership of all of our state organizations is less than ten per cent of the practitioners of dentistry in the United States. This does not mean that only ten per cent of our dentists are society men, as many belong to local and district organizations without being members of the state societies. It is probable that fully three-fourths of the dentists of the country are without society connection. These men must rely principally on our dental publications for new ideas and methods. Society work has, therefore, no influence with these men, except as they see it reported in the journals. The fact that three-fourths of the profession receive little benefit from society work is a bad enough condition, but the fact that this same three-fourths are doing little or nothing as their share toward the advancement of the profession is much more deplorable.

We are very much of the opinion that it is by no means entirely the fault of the men outside of our societies that they are not mem-

bers. It is rather the failure of the society men to extend the proper invitation. In Illinois over twelve hundred new members have been taken in and the society has now maintained its large membership for the third year, indicating that the new men have largely joined to stay and are doing their part in the work of advancement.

The component society plan of organization gives each man an opportunity to do something, and to get well acquainted with fellow practitioners of the community. It is rapidly becoming apparent in Illinois that the establishment of goodfellowship is and should be the basis of all effective society work. Whenever a feeling of goodfellowship has been established among the dentists of any section, those men treat each other and each other's patients well and are willing to give and take in all things. When the feeling is right among the men of a component society, all other things are easy; when the feeling is not right, it is practically impossible to accomplish anything.

Notices.

MONTANA STATE DENTAL SOCIETY.

The annual meeting of the Montana State Dental Society will be held April 12 and 13, 1907, in Helena. W. E. TRERISE, Secy., Helena.

ARKANSAS STATE BOARD OF DENTAL EXAMINERS.

The Arkansas State Board of Dental Examiners will hold examinations at Eureka Springs, May 27 and 28, 1907.

A. T. MCMILLIN, Secy., Little Rock.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

The thirteenth annual meeting of the Southern Wisconsin Dental Association will be held at Lancaster, Wis., May 21, 22 and 23, 1907. All reputable practitioners are cordially invited.

C. W. COLLVER, Secy., Clinton, Wis.

MINNESOTA STATE BOARD OF DENTAL EXAMINERS.

The Minnesota State Board of Dental Examiners will hold its next regular meeting at Minneapolis in the medical building of the State University on April 2, 3 and 4, 1907.

All applications must be in the secretary's hands by 11 o'clock of April 2. Candidates will be furnished all necessary blanks and such other information as is necessary upon application to GEO. S. TODD, Secy.,

Lake City, Minn.

GEORGIA STATE DENTAL SOCIETY.

The next annual meeting of the Georgia State Dental Society will be held in Atlanta, May 7, 8, 9 and 10, 1907. All ethical practitioners are cordially invited to attend.

D. H. McNeill, Cor. Secy.,
Athens, Ga.

ARKANSAS STATE DENTAL ASSOCIATION.

The Arkansas State Dental Association will hold its annual meeting at Eureka Springs, May 29, 30 and 31, 1907.

Henry P. Hopkins, Secy., Argenta, Kan.

SOUTHWESTERN MICHIGAN DENTAL SOCIETY.

The annual meeting of the Southwestern Michigan Dental Society will be held at Battle Creek, Mich., April 9 and 10, 1907.

C. W. Johnson, Secy.,
Lawton, Mich.

TEXAS STATE BOARD OF DENTAL EXAMINERS.

The Texas State Board of Dental Examiners will hold the next annual meeting at San Antonio, Tex., June 10, 1907, at 10 a. m.

For further information address C. C. Weaver, Secy.,
Hillsboro, Tex.

TENNESSEE DENTAL ASSOCIATION.

The fortieth annual meeting of the Tennessee Dental Association will be held at Knoxville, Tenn., July 9, 10 and 11, 1907. A splendid program is being arranged by the executive committee and a most cordial welcome is extended to all.

R. J. McGavock, Cor. Secy.,
Columbia, Tenn.

SOUTHERN NEBRASKA DENTAL SOCIETY.

The Southern Nebraska Dental Society met in Superior, Feb. 13, 1907, and the meeting was very successful. A business meeting will be held in Lincoln during the state meeting on May 22, 1907, at 3 p. m., at the Lindell Hotel.

Wm. A. McHenry, Secy.,
Nelson, Neb.

NEW JERSEY STATE DENTAL SOCITY.

The thirty-seventh annual meeting of the New Jersey State Dental Society will be held in the Auditorium at Asbury Park, N. J., commencing at 10 a. m., July 17, 1907, and continuing through the 18th and 19th. The headquarters will be at the Hotel Columbia, with the rates $3.50 and $4 per day, and all reservations must be made by July 1. Prominent dentists have signified their intention of reading papers and the clinics will all be new and of a novel nature. Clinic Committee is in charge of Dr. Charles H.

Dilts, Trenton, N. J. Exhibit Committee is in charge of Dr. Walter Woolsey, Elizabeth, N. J. Programs will be out June 15. Last year over 800 dentists registered in attendance. The Auditorium, where the meeting is held, is the largest and best adapted building on the Jersey coast. Cut off the week of July 15 and be with us. CHARLES A. MEEKER, Secy.,
29 Fulton St., Newark, N. J.

INDIANA STATE DENTAL ASSOCIATION.

The forty-ninth annual meeting of the Indiana State Dental Association will be held at the Claypool Hotel, Indianapolis, June 11, 12 and 13, 1907. The Executive Committee has arranged an unusually interesting program for this meeting. A cordial invitation is extended to the profession to be present. CARL D. LUCAS, Secy., Indianapolis.

CHICAGO ODONTOGRAPHIC SOCIETY.

At the annual meeting of the Chicago-Odontographic Society the following officers were elected for the ensuing year: President, F. E. Roach; Vice-President, F. W. Gethro; Secretary, F. H. Zinn; Treasurer, G. W. Dittmar; Librarian, J. H. Woolley; Board of Directors, H. A. Drake; Board of Censors, F. B. Noyes, J. E. Hinkins and C. E. Meerhoff.

F. H. ZINN, Secy.

VERMONT STATE DENTAL SOCIETY.

The thirty-first annual meeting of the Vermont State Dental Society will be held in Burlington, Vt., May 15, 16 and 17, 1907.

The Vermont society has in the past held most successful meetings, and we have every reason to expect that this will surpass any previous one, as a very interesting program has been prepared by the committee and will be mailed in due time.

Vermont has the largest per cent. membership in its State Society of any state in New England, and we hope to see every dentist in the state who is eligible a member. THOMAS MOUND, Secy., Rutland, Vt.

ALUMNI CLINIC OF THE ST. LOUIS DENTAL COLLEGE.

The Alumni Association of the St. Louis Dental College (formerly Marion-Sims) wishes to announce that the annual clinic will be held at the college building, Grand Avenue and Caroline Street, St. Louis, on May 7 and 8, 1907.

All ethical members of the profession are cordially invited to come and enjoy the festival of good things being prepared, and every member of the alumni is especially requested to show his allegiance to the association by his presence.

W. L. O'NEILL,
JOHN BERNARD O'BRIEN,
Committee on Publicity.

KENTUCKY STATE DENTAL ASSOCIATION.

The next annual meeting of the Kentucky State Dental Association will convene at Louisville, Ky., May 20, 21 and 22, 1907. We anticipate a most interesting and profitable meeting. A cordial invitation is extended to the profession. W. M. RANDALL,, Secy., Louisville, Ky.

MISSISSIPPI DENTAL ASSOCIATION.

The fourteenth annual meeting of the Mississippi Dental Association will meet in the County Court House, Meridian, Miss., May 21, 22, 23, 1907. All ethical practitioners of this and other states are cordially invited to attend.

Reduced railroad rates and reduced hotel accommodations will be secured. For full particulars address E. DOUGLAS HOOD, Secy., Tupelo, Miss.

NATIONAL DENTAL ASSOCIATION CLINIC.

The work of arranging the clinical operations, table clinics, etc., for the coming N. D. A. meeting is progressing. I had hopes that I might at this time publish the names of the District and State Chairmen, but that is impossible. The fearful floods and the great amount of snow which has fallen have prevented the usual mail facilities. It must be this, for the letters sent Dec. 20, 1906, in many cases, still remain unanswered.

Plans have been made which, if followed, should result in bringing to the meeting men from all the states in the Union and Canada.

As soon as possible each state will be provided with a local chairman who will make every effort to obtain such an array of talent that the Clinic of the National Dental Association which is to be held at Minneapolis on July 31 and August 1 will be the best ever arranged for the consideration of the members.

The work of the clinic has been divided.

Dr. W. N. Murray, Medical Block, Minneapolis, has been appointed Chairman of the Inlay Section. Dr. Murray is arranging special features for his department.

Dr. W. R. Clack of Clear Lake, Iowa, the secretary of the Clinic Section, has the territory west of the Mississippi River entirely under his jurisdiction.

I have the rest of the United States and Eastern Canada under my care.

The Executive Council has invited the members and friends of the Black Club to operate on one of the days of the Clinic. The invitation will be extended to them, and beyond a doubt it will be accepted.

The fact that I have been chosen Chairman of the Clinic Section does not mean that the Clinic is to be a Black Club Clinic. It simply means this, that I hereby extend a most cordial invitation to all reputable dentists in the United States and Canada to come, meet with us, and if you have anything new to introduce in methods of filling teeth or some new appliance you wish to demonstrate at a table clinic, come to us and be welcome.

Every chance will be given all to assist in making this a most memorable clinic. (I am not in position to invite to the Clinic those who have patented instruments or methods to sell; their place is the exhibit room.)

I would like every man who has anything which he feels is of value to others to know that if he will come and demonstrate it there is room on the program and at the meeting for him.

I am depending upon the District and State Chairmen to assist me. One man may do much, but many men who are willing to work and do work are able to do much more. I am bending every energy to make this Clinic the best the National has ever held.

The dental journals for July will contain the clinical program.

Those who wish their names to appear as operators or table clinicians must have them in my hands by June 1.

On July 1 the N. D. A. program goes to the printer.

E. K. WEDELSTAEDT, Chairman Clinic Section,
N. Y. Life Bldg., St. Paul, Minn.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The National Association of Dental Examiners will hold their twenty-fifth annual meeting in Minneapolis, Minn., beginning Friday, July 26, and continuing through the 27th and 29th.

Accommodations have been secured in the leading hotel of Minneapolis, "The West Hotel." Rates are as follows: Room without bath, $1.50 per day for each occupant; room with bath, $2 per day for one person, and $1 per day for each additional person in room. Hotel on European plan. Any room in the hotel capable of accommodating two persons. Telephone in each room; hot and cold water.

A large attendance of delegates is earnestly requested.

Committee on Colleges, Joint Conference Committee, Tabulation of Examining Board Reports, and the Committee for Promoting a System of Credits and Uniformity of Examinations will all give exceedingly interesting reports, valuable to all the members of the association.

Railroad rates will be given at a later date.

For information apply to

CHAS. A. MEEKER, D.D.S., Secy. and Treas.,
29 Fulton St., Newark, N. J.

LATEST DENTAL PATENTS.

836,299. Dentists' tweezers, Welby W. Burgin, Richmond, Ky.
836,697. Dental mirror, Walter H. Grant, Boston, Mass.
837,423. Dental handpiece, Alson C. Sargent, Des Moines, Iowa.
837,871. Toothbrush and dentifrice bracket, Lewis W. McConnell and W. V. Gage, McCook, Neb.
838,027. Tool for handling artificial teeth, Frederick L. Hunt, Asheville, N. C.
838,296. Dental work, Harrison D. Best, Pittsburg, Pa.
838,299. Head rest, Arthur W. Browne, Princes Bay, N. Y.

838,415. Artificial tooth, John H. Jackson, Boston, Mass.

838,648. Combination hand mouth mirror and chip blower and flushing and spraying device, Oliver T. Robertson, Milford, Ohio.

838,849. Porcelain and metallic crown, Charles A. Davis, Pasadena, Cal.

News Summary.

Dr. Oliver Robinson of Aspen, Colo., died Feb. 10, 1907.

Dr. H. H. Morrison of Greencastle, Ind., died Jan. 21, 1907.

Dr. John Conant, a dentist of Elgin, Ill., died Jan. 24, 1907.

Dr. William Kelly, a dentist of Alma, Mich., died Feb. 3, 1907.

Dr. Charles S. Reichert of Tipton, Iowa, died Feb. 16, 1907.

Dr. W. D. Haisley, a dentist of Dunkirk, Ind., died Jan. 12, 1907.

Dr. Henry J. Taft, a dentist of Brooklyn, N. Y., died Feb. 3, 1907.

Dr. D. A. Parrish, a dentist of Louisville, Ky., died Feb. 22, 1907.

Dr. O. S. Johnson, a dentist of Navasota, Tex., died Jan. 11, 1907.

Dr. Halvord Lee, a dentist of Eau Claire, Wis., died Jan. 9, 1907.

Dr. John R. Berry, a dentist of Baltimore, Md., died Feb. 20, 1907.

Dr. Carlton Kimball, a dentist of Portland, Me., died Jan. 15, 1907.

Dr. W. E. Costello, a dentist of Cleveland, Ohio, died Feb. 24, 1907.

Dr. J. E. Breeding, a dentist of San Antonio, Tex., died Jan. 22, 1907.

Dr. Henry A. Freeman, a dentist of Evanston, Ill., died Jan. 29, 1907.

Dr. J. P. Wentworth, a dentist of Brookline, Mass., died on Feb. 3, 1907.

Dr. Thomas M. Armstrong, a dentist of Philadelphia, died Feb. 5, 1907.

Dr. Martin Luther Kline, a dentist of Kittanning, Pa., died Jan. 9, 1907.

Dr. William C. Derby, a dentist of Ellenville, N. Y., died Jan. 31, 1907.

Dr. H. F. Roberts, a dentist, died at his home in Colfax, Cal., Jan. 29, 1907.

Dr. Charles M. Newton, a dentist of San Antonio, Tex., died Feb. 20, 1907.

Dr. Frank C. Gill, a dentist of Rockford, Ill., died of pneumonia Feb. 7, 1907.

Mrs. Arthur T. Moore, wife of a dentist of St. Joseph, Mo., died Feb. 12, 1907.

Dr. Julius W. Peter, a dentist of Chicago, died in San Antonio, Tex., Feb. 11, 1907.

Dr. A. J. Grosvenor, a dentist of Springfield, Ohio, died of apoplexy Jan. 24, 1907.

Dr. Charles W. Hill, a dentist of New York, was taken suddenly ill on Feb. 6, 1907, while on the way to attend the funeral of a friend and died before reaching the hospital.

DR. THOMAS J. WHEATON, a dentist of Wilkesbarre, Pa., died Jan. 26, 1907, aged 81 years.

DR. W. D. BEVIER, a dentist of Milwaukee, Wis., dropped dead from heart disease Feb. 8, 1907.

DR. ISAAC WADSWORTH STILES, a dentist of West Haven, Conn., died of heart disease Feb. 9, 1907.

DR. D. J. PHILLIPS, a dentist of Indianapolis, Ind., died Feb. 25, 1907, after an illness of eight years.

DR. L. L. LESLIE, a dentist of Janesville, Wis., and a member of the State Dental Board, died Jan. 28, 1907.

DR. R. E. CASON, a dentist of Cartersville, Ga., died Jan. 21, 1907, from the effects of a stroke of paralysis.

DR. WILLIAM J. WYCKOFF, a dentist of Chagrin Falls, Ohio, dropped dead from heart failure Jan. 17, 1907.

DR. RICHARD C. PAYMENT, a dentist of Detroit, Mich., died suddenly of heart disease in his office Jan. 22, 1907.

DR. ARTHUR REICK, a dentist of St. Paul, Minn., died at the home of his parents in Winona, Minn., Jan. 26, 1907.

DR. GEORGE A. SWEETMAN, a Chicago dentist, was found dead in bed Feb. 17, 1907. He had suffered with heart trouble.

DR. FRANKLIN JACOBS, a retired dentist of Quincy, Mass., died at the Soldiers' Home in Chelsea, Mass., Jan. 16, 1907.

DR. ISAAC WALKER, a retired dentist of Strasburg, Pa., died on Feb. 16, 1907, of old age. He had served as town clerk for 45 years.

DR. EDWARD J. CHURCH, a dentist of Laporte, Ind., and a member of the State Board of Dental Examiners of Indiana, died Feb. 1, 1907.

DR. SAMUEL A. MCDOUGALL, a dentist of Boston, Mass., died Feb. 8, 1907. He was one of the organizers of the Massachusetts Dental Society.

DR. J. H. YOUNG and his wife died within twelve hours of each other at their home in Bridgeport, Conn., Jan. 9, 1907. Dr. Young was a retired dentist. Both had been ill for some time.

DR. C. W. BARNES, a dentist of Madison, Ill., died from the effects of coal gas escaping into his room. He was a veteran of the Civil War and for eleven years practiced in Brazil and Argentine Republic.

DR. E. W. HAINES, a dentist of Newark, Del., died Jan. 25, 1907. He was in his 84th year and was the oldest practicing dentist in Delaware. He had practiced in Newark for 65 years.

DENTIST GOES INSANE.—Dr. E. E. Hawley of Golden City, Mo., was committed to the insane asylum at Lamar, Mo., Jan. 15, as he had become violent a few days before.

MIXING PLASTER.—With the patient's mouth in readiness and the tray in convenient position for filling, proceed to mix, using distilled water about 70°. Sift the plaster slowly into the water with little or no stirring; when

the last particle has disappeared below the surface of the water, pour off the surplus and the plaster is ready for the impression.—ALFRED P. ROGERS, *Items of Interest.*

HARVARD'S NEW DENTAL BUILDING.—Plans for the new building which Harvard is to have for its dental college are being drawn. The estimated cost of the building is $250,000.

UROTROPIN.—Aminoform, or urotropin, a combination of ammonia and formaldehyd gas, is considered a very valuable antiseptic.—E. T. LOEFFLER, *Dentists' Magazine.*

THE CAVITY.—

Cholly—"The dentist told me I had a large cavity which needed filling."

Ethel—"Did he recommend any special course of study?"—*Exchange.*

DENTISTS ARE CONVERTED.—According to newspaper report and as a result of the recent revival held by "Billy" Sunday in Kankakee, Ill., it is said that every dentist of that town has been converted.

TO TEACH DENTISTRY TO THE CHINESE.—Dr. William H. Gutelius of Pittsburg, Pa., has left for Canton, China, where he is to have charge of the Dental Department of the Canton Christian College.

TO CLEAN PLATES.—To remove calcareous deposits from rubber plates, drop them in a solution of muriatic acid and water; one part of acid to ten of water. Result is immediate.—*Western Dental Journal.*

FORTUNE LEFT AN ASSISTANT.—Mrs. Catherine Degnan, for 23 years an assistant of Dr. James L. Simonds in his dental office in Boston, Mass., was willed the beautiful home of her employer, who died recently.

LEAKY SYRINGE.—If the hypodermic syringe leaks around the packing, cut some washers out of a baseplate guttapercha, put in place and warm slightly over an alcohol lamp, then screw up tight.—*Western Dental Journal.*

ILLEGAL PRACTITIONERS.—Two dentists of Logan, Utah, pleaded guilty on Feb. 6 to practicing without licenses and were fined $5 each and costs. —Two men are under arrest at Stockton, Cal., charged with practicing dentistry without licenses.

TO PRESERVE RUBBER.—One part of ammonia in ten to twelve parts water will preserve soft rubber. Dip rubber pipes, etc., in a glass jar filled with this solution. For the ammonia bottle use a rubber stopper; it is better than a glass one.—*Cosmos.*

NERVE PASTE.—It has been suggested to add to nerve paste, so called, or devitalizing paste, adrenalin, in order to control the tendency to swelling of the pulp which causes the pain usually experienced from application of arsenic.—*Dentists' Magazine.*

BEQUEST BY MASSACHUSETTS DENTIST.—An institution for female orphans will be founded with the fortune of $100,000 left by Dr. James L. Simonds, the well-known Dorchester (Mass.) dentist, who died on Thursday, December 8, in his 82d year. Annuities for several relatives and friends are contained in the will, which has been filed for probate, but as these will be

taken care of from the interest, the principal will remain intact, and the whole amount will go to the charity named after twenty-one years.—*Boston Advertiser.*

DIVORCES.—Mrs. Grace Leslie Barclay, after efforts covering thirteen years, was granted a divorce on Feb. 6 from Dr. John Charles Barclay, formerly a Chicago dentist. She charged him with cruelty and desertion and was given $12,000 alimony.

FACTS IN THE CASE.—

"Are you of foreign extraction?" asked the cross-examining lawyer.

"Faith, an' Oi'm not," replied the witness. "All th' teeth Oi haven't got wor ixtracted in this country, begorry."—*Exchange.*

AMALGAM REPAIRS.—Fresh amalgam can be made to adhere to an old amalgam filling by merely coating the freshly exposed surface of the latter with chlorhydric acid. The same object can be attained by treating the freshly exposed surface with silver nitrate.—*Dental Brief.*

INLAY ADHESION.—Before adjusting an inlay the cavity should be dried and wiped with cement liquid; the inlay should be treated in the same way and the surplus liquid wiped off. This will produce a stronger adhesion when the inlay is cemented.—W. H. UPJOHN, *Dental Summary.*

REMOVAL OF TRAYS FROM MUFFLE.—Coarse silex sprinkled over the floor of the muffle will prevent adhesion of trays, whether of clay or platinum. No attempt should be made at any time to remove the silex; most of it becomes a fixture and serves a good purpose.—*Dental Office and Laboratory.*

SCHOOLS TO MERGE.—Committees representing St. John's College and the law, medical and dental departments of the University of Maryland have met to arrange for a merger of these institutions. It is expected that the terms of the merger will be arranged and the agreement signed.—*Baltimore Press.*

PUTRESCENT PULP.—On opening up a pulp chamber in which there is a putrescent pulp giving out a most offensive odor, dip your broach in oil of turpentine and insert in canal; the odor will change almost instantly, most agreeably to both yourself and patient.—J. E. MCDONALD, *Dominion Dental Journal.*

INSANITY FOLLOWS TEETH EXTRACTION.—Mrs. Margaret Loftus of Winona, Minn., has been committed to the insane asylum because of a mental condition brought about by loss of sleep following the extraction of a number of teeth. It is believed that she will recover her reason within a short time.

DINNER TO DR. JARVIE; FIFTY YEARS A DENTIST.—One hundred and fifty of the most prominent dentists in this and other parts of the country were the hosts, Saturday, November 17, of Dr. William Jarvie of Brooklyn, at a complimentary banquet given at the Waldorf-Astoria Hotel to commemorate Dr. Jarvie's retirement from practice in the dental profession. Not only were these dentists present in the flesh, but others scattered over this

country and in Europe paid tribute to a man who grew up and developed with the profession, practicing a full half century. The dinner was given by the Second District Dental Society.—*Dental Brief.*

False Teeth as Life Savers.—A resident of Waukegan, Ill., has his false teeth to thank for the fact that he is alive. He fired a bullet into his mouth in the attempt to commit suicide a few days ago, but the plate in his mouth deflected the bullet so that it lodged in his jaw, causing only a painful wound.

Cementing Arsenic.—Mix the cement rather thin and place a small drop of it on a bit of paper, and carry the paper to the cavity with the pliers; then press to place with a burnisher. The paper facilitates adjustment to place and prevents the cement adhering to the instrument.—C. B. Warner, *Tri-State Quarterly.*

Fair Lobbyist Seeks Passage of Dental Bill.—Miss S. Holmes of Tillsonburg, Ont., has turned lobbyist in her desire to have the Legislature pass a bill which will make it possible for her to take the examinations given dentists. She has been practicing for a number of years, but never has undergone examination.

Protecting Porcelain Surfaces for Solder Work.—If porcelain surfaces in bridge work are coated with sandarac varnish before investing, and care is taken to have the investment thoroughly heated before beginning soldering, it will result in little or no cracking or checking of the porcelain.—Henry C. Lee, *Dental Review.*

Old Fashioned.—

"Shall I give you gas, sir?" said the English dentist to his patient from the country.

"Na, na," was the answer, "I'm for nane o' thae new-fangled inventions. Jest gie me parafin oil."—*Exchange.*

Sneak Thief's Scheme.—A successful scheme was worked by a sneak thief in four dental offices in Bridgeport, Conn., on Jan. 28. He entered the offices saying he expected to meet his sister, and when another patient entered the inner office he made off with the pocketbook left behind. In one office he secured $7 and in another $8.

Matrix for Pouring a Model.—Dip in melted wax until saturated a strip of tape two inches wide and about eleven inches long; allow it to cool. When wanted warm it slightly and place around the impression tray to which it will conform without sticking to the plaster when poured, making a good matrix rim.—G. E. Truitt, *Dental Cosmos.*

Learn to Tell.—To write and speak well we must think well. Only a few think clearly, methodically and definitely. We are apt to think at random and therefore talk and work at random. If we take an hour a day to study some good author on English composition and do our best each day for a while to reduce to practice what we learn, we should gradually become good speakers and writers. This discipline in thinking and putting our thoughts on paper would materially improve our whole practice. It

should be the aim of the dental student to improve his spare time writing for his college paper. It means many steps on the long ladder before him.—*The Odontoblast.*

STERILIZATION OF DENTURES.—Sulfurous acid will absolutely deodorize and disinfect a denture, and not merely cover the odor of a plate that has been worn in the mouth. Place a few drops in a little water and immerse the case in the solution at night and cleanse with soap and brush in the morning.—J. KENNERLY, *British Dental Journal.*

MUST SHOW PHOTO TO GET LICENSE.—Every applicant for a license to practice dentistry in Pennsylvania hereafter will be required to present with his application for examination by the state dental board a photograph of himself certified by the dean of the college from which he was graduated, and signed by the candidate himself.—*New York Mail.*

ARRESTS.—The Frank S. Betz Manufacturing Company caused the arrest of one of its employes, charging him with the theft of $3,000 worth of gold and amalgam. His relatives paid the company its claim and he was not prosecuted.—A traveling dentist of Minneapolis was arrested on Feb. 21 at Buffalo, Minn., charged with passing counterfeit money.

THE QUANTITY RATE.—Bargain-counter customer over the 'phone—"Dr. Blank?" "Yes." "Doctor, what do you charge for silver fillings?" "Twenty-three cents a dozen; same price as eggs." "I-n-d-e-e-d!" And the would-be funny dentist swears that he saw the lady's lip climb to the gingival margin of her left superior cuspid.—*D. O. & L.*

THE DENTIST'S DILEMMA.—A dentist who was the defendant in a judgment summons case at the Southwark county court said that his instruments were constantly in pawn and that when a patient called to have a tooth pulled he made an appointment, borrowed the money to get the instruments out of pawn, and pledged them again as soon as the operation was over.—*British Jour. Dental Science.*

PREPARING SENSITIVE CAVITIES.—A comparatively painless method of cutting away a large body of sensitive dentin is to have the stones or burs run in water. I think about the most painful thing which you can do to a patient is to run a bur at a high speed in a dry cavity. I am able to do this so-called heroic cutting with the stones run in water, so that the water is almost a running stream upon the bur or stone, and it can be run at a high rate of speed.—E. J. PERRY, *Dental Review.*

RENOFORM.—The active principle of renoform is suprarenin, obtained from the suprarenal gland. A very small quantity injected locally contracts the blood vessels and thus, by shutting off the blood supply to the nerves, they lose all power of transmitting sensation. The few minutes needed to induce anesthesia is not lost time, for one can operate much quicker as well as better if the patient is not suffering and therefore remains quiet. In general I would say that renoform is indicated first, for extraction of teeth; second, for destroying pulps; third, for painless preparation of all cavities in otherwise sensitive teeth; fourth, for cleansing the roots of diseased teeth where

the gum tissue is inflamed and sensitive; fifth, for preparing live teeth for gold crowns or bridges; sixth, for permitting painless application of the separator.—CHARLES P. HASELDEN, Hamburg, Germany, *Dental Review.*

PREPARATION FOR CROWNING.—All old amalgam fillings should be removed before grinding as caries may be rampant underneath; these cavities should be refilled with either cement or amalgam before commencing to make the crown so that the band will not catch on the sharp edge of the cavity. Always complete root treatment before cutting down tooth or grinding it.—H. LEONARD DORRELL, *Dental Record.*

DIE METAL FOR MODELING COMPOUND IMPRESSIONS.—In cases where it is impossible to secure a plaster of Paris impression a die can be obtained from modeling compound by using the following die metal: Bismuth, 48 per cent.; cadmium, 13 per cent.; lead, 19 per cent.; tin, 20 per cent. This can also be poured into wet plaster of paris with little or no risk.—DR. O. H. SIMPSON, *Dentists' Magazine.*

SUICIDES.—George Petrof of Milwaukee, Wis., manufacturer of dental instruments, died Feb. 20 from the effects of an attempt he had made two weeks previously to commit suicide.—Dr. Girard, a dentist of La Crosse, Wis., was found dead on Feb. 9. He had taken morphin.—Dr. M. Broderick of East Huntsville, Tex., who had become melancholy over poor health and the loss of his sight, killed himself Feb. 12.

A JOKE ON THE DENTIST.—

"Well, Mrs. Finnegan, hov yer had yure tooth pulled?"

"Yis; an' begorra, th' joke's on th' dentist."

"How so?"

"He claimed to be wan av thim painless wans, and Oi niver wor so nearly kilt in all me loife."—*Exchange.*

TOOTH IMPLANTATION.—The successful implantation of a recently extracted tooth depends mainly upon the condition of the pericementum. Extracting and immediately replanting a sound tooth, it is possible to obtain complete regeneration of the pericementum; clinically, this may occur when a sound tooth is extracted by mistake and replanted without delay. Pulp restoration, though not a constant occurrence, cannot be considered within the range of impossible phenomena when the operation has been performed under strictly aseptic precautions.—MENDEL-JOSEPH AND SASSONVILLE, *L'Odontologie.*

BENT-WIRE CLASPS.—The greatest improvement in clasps as plate supporters consists in forming them of round or half-round platinous gold wire, bent upon itself, or doubled, and so shaped as to include in its grasp as much of the circumference of the tooth as clasps usually do. This open or bent-wire clasp, by its form, possesses the peculiar advantage of having one of its folds just above the greatest diameter of the crown, and the other just below it. By this means the tooth is not only more firmly grasped, but the clasp, by virtue of its shape, can neither slip up toward the gum nor down toward the occlusal surface. This form of clasp is

far more correct in principle than the former kind, where the flat surface of the clasp in contact with the convex surface of the tooth was intended to afford the desired resistance.—S. H. GUILFORD, *Stomatologist.*

STERILIZING IMPRESSION TRAYS AND IMPRESSION MATERIAL.—Impression trays should be thoroughly washed and polished when the impression material has been removed. Impression material may be effectively sterilized without damage by placing it in a double saucepan with a lid having a hole in it for a thermometer and keeping it at a temperature of 160° F. for an hour and a half.—J. H. BADCOCK, *British Dental Journal.*

BANKRUPTS.—Dr. James M. Somers of Portland, Me., has filed a petition in bankruptcy, giving his assets as $170 and his liabilities as $1,068.—Dr. Louis N. Chapman, of Boston, Mass., has filed a petition in bankruptcy, giving his liabilities as $598, and claiming he has no assets.—Dr. B. F. Wolf, of Fremont, Ind., desires to be declared a bankrupt. He gives his assets as $340, and liabilities, $350, with the assets exempt.

SILK FIRST, THEN THE CLAMPS.—I desire to call attention to the application of one or two ligatures in placing a clamp upon a tooth. One circle of floss silk will prevent the clamp from impinging upon the gum. If the tooth is cone shaped, two should be put on; one will prevent the clamp from moving upward and the other from jumping off, and there will be saved the pain from impingement.—DR. H. C. REGISTER, *Brief.*

AN EYE FOR A TOOTH.—A young man of Doylestown, Ohio, has experienced a paraphrase of the Biblical phrase, "an eye for an eye and a tooth for a tooth." The extraction of an eye tooth, which had troubled him for a long time, was followed, within a short time, by the regaining of the sight in one eye which had been all but gone for two years. It is regarded as merely a coincidence, but it is an interesting one.

DENTIST EXONERATED.—Mr. A. T. H. Pittar, dentist, of Sydney, was recently defendant in an action to recover £1,000 for injuries alleged to have been caused by his negligence. The plaintiff had some teeth extracted and subsequently suffered from suppuration in the face and orbit, ending in the loss of the left eye, and it was alleged that the forceps used had not been sterilized. Evidence was given for the defendant showing that the instruments used were sterilized and that there were an alveolar abscess and cellulitis present when the teeth were extracted. A verdict was given for the defendant.—*Dental Record.*

METHODS OF DIAGNOSIS: THE EXPLORING NEEDLE AND THE X-RAY.—The exploring needle in the hands of a skillful dental surgeon whose touch has been "educated" locates hidden roots, abscess cavities, necrotic tissues, and phagedenic destruction of bone. Its revelations are swifter and surer, under some conditions, than those of the X-ray.

In locating malplaced and unerupted third molars, the X-ray method is unequaled. But there are comparatively few dental surgeons provided with the facilities or equipped with the skill and training in the art of skiagraph pictures necessary for formulating an accurate diagnosis by this

means. No one will dispute the value of this insight into the hidden things of nature; and when all other means have failed to give the operator a fairly clear mental picture of the case before proceeding we should resort to this, even if it should be necessary to call in the aid of a specialist in the work.—L. G. Noel, *American Journal.*

Hypodermic Injections in the Gums.—A 10 or 20 per cent. solution of chloretone in 75 per cent. alcohol is valuable as a topical application previous to the use of the hypodermic needle in the gums. The alcohol cuts the mucus and leaves the membrane absolutely clean with resulting sterilization of the field of operation; the anesthetic action of the chloretone insures the minimum of pain.—T. A. Gormley, *Dental Register.*

Dentists in Tamatave.—Consul Hunt, at Tamatave, reports that he has been informed by the new Governor General of Madagascar that under the laws now in force no dentists, whatever be their nationality, will be permitted to practice their profession in that colony who do not have a diploma from a French dental school. This ruling by the present Governor General is in direct opposition to a ruling by his predecessor, who in a note dated April 19, 1902, stated that the requirement would be waived in favor of a well qualified American dentist who might wish to establish himself in Madagascar.—*New York Herald.*

Perhydrol (Hydrogen Dioxid) in Dental Hyperesthesia.—Viggo Andresen, of Copenhagen (*Deut. Monatsschrift für Zahnheilkunde,* January, 1905), states that a few drops of the 30 per cent. hydrogen dioxid (perhydrol) of Merck acts almost instantaneously in anesthetizing the dentin. It is to be preferred to silver nitrate, since it bleaches instead of staining. In filing off long teeth much pain can be avoided, but for the pulp itself the drug is entirely too irritating. In cavities that cannot be kept dry, it also serves to disinfect, while the cauterization is too short in duration to be harmful.—S. H. Guilford, *Stomatologist.*

Behavior of Cement Under Different Climatic Conditions.—Climatic or atmospheric conditions so alter the behavior of a given cement combination that these must be taken into consideration. Working in a crowded clinic room, for instance, in midwinter, one will have an experience with cement very different from that when using the same cement in his private surgery the previous or following day, all because of the humidity of the atmosphere. There are combinations suited to hot, humid atmospheres and to dry, cool atmospheres. I cannot consistently give definite examples of cements for special purposes, but the selection is easy, since the cement for a tropical atmosphere must be slow of setting, while in a cool, dry atmosphere such a one would prove unsatisfactory. I ventured the statement a dozen years since, that far better cement work can be done in midwinter than in midsummer, and for the same reasons better cement work can be done in dry, temperate climates than in equatorial regions, which might be illustrated by the sea-coast and elevated interior of Mexico. The fact is often cited that natives of

northern Europe are seen in this country with exceptional cement fillings. This can easily be attributed to favorable climatic conditions, and to the fact that the main training of dentists in those countries is in the use of plastics. I am not willing to admit that better materials are used in those countries than in the United States.—W. V. B. AMES, *Dental Summary.*

ACCIDENTS.—Dr. Fred Daniels of Elwood, Ind., was badly injured by the explosion of a vulcanizer in his office. It is probable that he will lose the sight of one eye.—E. L. Moravec of Cedar Rapids, Iowa, a member of the senior class of the Dental Department of the University of Iowa, was injured by getting sulfuric acid in his eye while working at a clinic.—Dr. G. E. Wasser of Laporte, Ind., may lose the sight of one eye as the result of an accident which he suffered Feb. 12. He dropped a bottle of carbolic acid and some of the fluid entered the eye.—Dr. J. M. Lovett of New Decatur, Ala., was injured Feb. 16 by falling from a moving street car.

METHOD OF SETTING AN INLAY.—Instead of using direct pressure, as so many dentists do when they wedge an inlay to place, I put the inlay in position and draw a wide piece of tape over it, as I would in polishing a gold filling with a polisher. This keeps teetering the inlay from one end to the other, and if you keep going over it you will be surprised how much closer the inlay will become seated than if you use any amount of direct pressure. Direct pressure on the inlay will not squeeze out the cement, because the particles of cement rest on top of each other and cannot get away. I use a piece of tape twice the width of the inlay.—W. H. TAGGART, *Dental Review.*

FATALITIES.—A woman in Manhattan, Kan., died Feb. 12, in a dentist's chair, after an anesthetic had been administered by a physician.—A Springfield, Ill., woman died in a dentist's chair, Feb. 19.—A woman died in a dentist's chair in Blue Mound, Ill., from the effects of chloroform and the shock received from the crushing of a tooth.—A man died in a dentist's chair in Cleveland, Ohio. He had been in poor health for some time.—A twelve-year-old boy of Cohocton, N. Y., died in a dentist's chair from the effects of chloroform.—A woman whose home is in Ballard, Wash., died in the office of a Grand Rapids, Mich., dentist, after having had six teeth extracted.

SCIENTIFIC RESEARCH FUND.—"The Odontological Society of Great Britain has issued its usual notice with respect to 'Grants in Aid of Scientific Research.' The society is prepared to receive applications for grants in aid of the furtherance of scientific research in connection with dentistry. For particulars and forms of application apply to the Hon. Sec., Scientific Research Committee, Odontological Society, 20 Hanover Square, London, W."

The above notice appeared in a recent issue of the *Dental Record* (London). It is brought to the attention of our readers for the reason that the plan would seem to have features that must commend it to those interested in research work either directly or otherwise. By inaugurating such a movement in connection with our National Association or the individual

state society there is but little doubt that much that is, as yet, untried and new in the field of dental science could be studied systematically and thoroughly by those best fitted, with the result that the entire profession in this country and abroad would greatly benefit thereby.

HOLLOW INLAYS.—When using low fusing porcelain I am in the habit of laying on the inside of the matrix little pellets of gold of proper size, and placed where it would serve to help retain the filling. I am in the habit of varnishing the inlay with shellac, that there will be no adhesion of the gold to the porcelain so as to change its form. After the inlay is fused the pellets may be picked out, leaving cavities into which the cement will flow, and it gives that much of an additional hold to it. For high fusing I have used plumbago—ordinary lead pencil. It will stand the heat and I have observed no change in the shade from the use of it.—C. B. ROHLAND, *Dental Review.*

BUSINESS IN DENTAL PRACTICE.—Relative to the payment for our supplies, while there are some practitioners who are prompt, there is too much carelessness shown by many in this particular. Comparatively few take advantage of the 10 per cent. discount offered by the dental depots in paying for $100 worth of supplies in advance. This represents quite a saving, and it would be a very difficult matter for any of us to invest our money to better advantage. It is a very desirable thing to do and with responsible houses it is perfectly safe. When favors are shown in the courtesies of commercial relationship the dentist who discounts his bills is quite certain to receive such attention.—*Dental Office and Lab.*

FIRES.—Slight damage was done to the office of Dr. H. R. Staley in Lanark, Ill., during a fire on Feb. 3.—Dr. Barber of Deshler, Ohio, suffered a loss of $700 through a fire which destroyed his office on Feb. 20.—The office of Dr. Hoskin of Callaway, Neb., was damaged by fire on Feb. 5.—A loss of $75 was sustained by Dr. S. S. Gasse of Washington, D. C., as the result of a fire on Jan. 26.—The office of Dr. Roy McCulla of Odebolt, Iowa, was totally destroyed by fire on Feb. 5.—The office of Dr. Allender of Waterloo, Iowa, was damaged by fire on Jan. 28.—The office of Dr. S. M. Stayde of Garner, Iowa, was badly damaged by fire on January 16; loss $600.—The office of Dr. T. B. Smith of Corning, N. Y., was badly damaged by fire a few days ago.

HOW TO DETERMINE THE DIRECTION OF THE CONDYLE'S PATH.—To find what is the direction of the condyle's path in a patient, the dentist may proceed thus: Having taken the articulating impression in the usual way—this method cannot be used with the squash bite, unless in connection with the true-bite plates—and before removing it from the mouth, let him ask the patient to protrude the mandible as far as possible—which will be about a half inch—and then to close it again. If the patient's condyle path inclines downward, the two planes of wax will now meet only in front, but if it is horizontal they will remain in full occlusion with each other. If the former, the amount of their opening at the molar region may be determined by inserting a knife-blade or small stick of wood, marking its

position—also marking the extent of protrusion—so that when the articulating impression is transferred to the articulators, and a similar protrusion is made on them and the knife-blade or stick is inserted in the same place, it can be readily seen if the articulator's mechanism representing the condyle's path needs adjusting to suit the case.—STEWART J. SPENCE, *Dentists' Magazine.*

USE OF AMALGAM.—As it is well known and generally conceded, the quick setting amalgams do more for the prevention of decay than any other single material. There are places where nothing else is indicated, and it is often used with good results, even where it is not best suited. When the selection of a filling material for any of the posterior teeth becomes a close question it is generally well to be on the safe side and choose an amalgam. Where we find large cavities extending beyond the gingival line of the molars, amalgams are almost specific. Sometimes we find cavities so large that it is not advisable to place gold, and yet a crown is not indicated; in such cases a well contoured amalgam may last for years.—E. J. LEWIS, Denver, Colo., *Items of Interest.*

REMOVAL OF A BROKEN GATES-GLIDDEN DRILL.—Many are lucky enough never to break a Gates-Glidden drill only where they are intended to break —up near the shank. Not long ago, in cleaning out an upper lateral, my Gates-Glidden drill broke off, leaving about a quarter of an inch of drill in the tooth. After failing to get it out by the use of pliers, etc., I stepped over to the stock room of a telephone company, and, borrowing a large horseshoe magnet, magnetized another Gates-Glidden drill by allowing the drill to rest on the magnet for a short time; placed the drill alongside the piece still in the tooth, worked the one thus magnetized around in the tooth to be sure there was a good contact; removed the Gates-Glidden, and the broken piece came out with the magnetized drill.—DEWEY D. SMITH, *Dental Summary.*

ROBBERIES.—Dr. W. L. Buchanan of Washington, D. C., Feb. 5, instruments worth $100.—Drs. McNeil, E. F. Brown and Fitzpatrick, who occupy the same floor in a Birmingham (Ala.) building, Feb. 5, gold amounting in all to $210.—A burglar visited all the dentists of Pine Bluff, Ark., on Jan. 26. He stole gold to the amount of $75 from Dr. Grundy and took about $60 worth from the offices of Drs. Mayfield, Land, Edgar and Black. —Dr. C. G. Farrow of Little Rock, Ark., Jan. 29, $50 worth of gold.—Dr. R. A. Jennings, Sterling, Ill., gold and instruments worth $20.—Dr. Walter O. West, New Orleans, La., teeth and gold worth $68.—In Birmingham, Ala., on Jan. 14, burglars secured $140 worth of gold from Dr. Ruch, $100 worth of gold and instruments worth $25 from Dr. I. Jones, and gold and other materials for filling teeth worth about $100 from Dr. C. P. Robinson and Drs. R. C. and S. J. Gordon.—Dr. E. J. Applewhite, Newport News, Va., Jan. 16, $70 worth of teeth, platinum and gold.—Dr. I. Jonas, Mobile, Ala., Jan. 13, valuable instruments.—Dr. O. M. Barker, Morris, Ill., Jan. 27, gold worth $20. This is the second time within six months that his

office has been robbed.—Dr. C. A. Hickman, Fort Worth, Tex., Feb. 12, $25 worth of gold.—Dr. C. G. Adams, Wichita, Kan., Feb. 14, gold worth $150.—In Allentown, Pa., Feb. 19, Dr. C. S. Miller, Dr. G. J. DeLong and Dr. C. A. Hering, about $60 worth of gold.

Silver Solder.—Put into a clean crucible pure silver two parts, clean brass one part, with a small piece of borax. Melt and pour into ingot. Formerly I used to return the solder to the crucible for a second melting, but it is not necessary. The solder flows easily and clean. Solder made from coin, as it frequently is, often melts with difficulty, and remains lumpy around the joints, requiring the use of the file to remove it, while the addition of any of the inferior metals to the solder causes it to eat into the article joined by it. The use of silver solder is greatly on the increase, especially in the work of making, filling and repairing orthodontic apparatus. An ideal preparation, but now difficult to get, is the old-time three-cent silver piece; it melts readily, flows like grease and sticks like the historic brother.—*Dental Office and Lab.*

The Teeth of School Children.—The *Morning Post* (London) says: "It is sometimes candidly pointed out by dentists that in spite of all the resources of their science the teeth of the Anglo-Saxon race are growing worse from generation to generation. If there is any unsuspected cause for this it is all the more necessary that the teeth of school children should be looked after, and probably there is so much to be said for rate-aided supervision as for rate-aided meals. Some attempt is being made in Germany to carry out this kind of examination, and a consular report from Frankfort gives some suggestive figures of an examination of the teeth of 1,020 children whose teeth were examined at Hocheide. There were 482 boys and 538 girls. The boys had 12,826 defective teeth and only 2,116 sound ones. Only 19 boys had perfectly sound sets of teeth. Of the teeth of the girls 15,747 were defective and only 931 sound. Only 16 girls had perfect sets of teeth; 293 girls were suffering in their general condition in consequence of decayed teeth. The total result showed that 90 per cent. of all the teeth examined were defective; only 35 out of 1,020 children had sound sets of teeth. In 396 children a poor bodily constitution was due to poor teeth."—*Dental Record.*

Ethyl Chlorid and the Probable Percentage of Fatalities.—Dr. Luke writes to the *Lancet:* "In an article with the title 'Fatalities Under Ethyl Chlorid,' published in the *Lancet* on May 5 last, p. 1233, I endeavored to make a rough estimate of the number of times which the drug had been employed for general anesthesia during the past three years in this country and arrived at the figure of 450,000. Information which has recently come to hand shows that I was very much within the mark. I am told by the London agent of Messrs. Duncan and Flockhart that during this period they have sold sufficient ethyl chlorid for 1,500,000 administrations at five cubic centimeters each. If to these be added the cases for which ethyl chlorid is manufactured by other firms, such as Hedley, Bengue, Kuhn and the

Kelene Company the number of narcoses cannot be put as much under 3,000,000. Up to date 20 deaths are reported in Great Britain—giving a mortality of 1 in 150,000. With these figures before us I am at a loss to understand how certain anesthetists of repute steadfastly refuse to employ ethyl chlorid alone or in combination. As an offset to the 20 fatalities I am confident that it has saved many lives, or prevented fatalities which would have occurred had chloroform been substituted for it."—*Dental Record.*

LAW SUITS.—A Cincinnati dentist is suing a brewing company of that city for treating the fractured jaw of an employe of the company who was hurt in an accident, the work having been ordered by the company, who refused to pay the bill, it is alleged, when it was presented.—A dental company of Memphis, Tenn., has been made defendant in a suit for $5,000 for alleged careless treatment.—A Minneapolis dentist is charged by a woman patient with having pulled a tooth when she did not pay him for a crown.—A woman of Milwaukee, Wis., lost her suit for $1,000 damages brought against a dentist whom she charged with having extracted two sound teeth instead of two decayed ones.—The estate of a dentist of Anamosa, Iowa, who died last October, is being sued for $3,000 by a man who claims the dentist was negligent in treating his teeth and that necrosis resulted.—Two dentists of Des Moines, Iowa, who had caused each other's arrest on the charge of assault and battery, became reconciled and their charges were withdrawn.—A San Antonio man was awarded damages of $400 against a dentist who had agreed to cure him of pyorrhea and had failed.—A dentist of Newark, N. J., is being sued for $10,000 damages by a woman who claims that a surgical operation was made necessary on account of negligence on the part of the defendant.—A dentist of Niagara Falls, Ont., won a suit for $49.04 brought against a consul at that place for work done for his family.

EXAMINING BOARD AFFAIRS.—The demurrer of the State Board of Rhode Island to the petition of Evan B. Rosenkranz of Providence, who asked for a writ of mandamus to compel the board to issue a certificate allowing him to practice his profession, was sustained.—The powers of the State Board of West Virginia will be increased if a bill before the Legislature is passed.—Dr. John W. Menzie of Philadelphia and Dr. C. P. Waugman of McKeesport, Pa., were acquitted on Feb. 15 of the charge of having conspired to defraud the State Board of Dental Examiners.—The report of the State Board of Ohio filed on Feb. 16 suggests that a permanent place for the holding of examinations should be provided, thus "dignifying" the examinations.—A bill which has aroused a great deal of opposition in the Missouri Legislature is one which provides that the State Board shall issue a license without examination to any dentist who has practiced five consecutive years in any one city.—In the South Dakota Legislature they are having lively sessions over the qualifications for dental certificates. Dr. Carlisle of Sioux Falls is working to have the requirements made less

exacting, as he claims the present State Board has formed a close trust and has set such regulations that few dentists can qualify.

DENTIST ACQUITTED.—Dr. James W. Simpson, a dentist of River Head, L. I., was acquitted of the charge of having murdered his father-in-law, Bartley W. Horner, who was shot to death at the Simpson home on Dec. 27, 1906.

MARRIAGES.—C. P. Dennis, a dentist of Portsmouth, Ohio, was married to Miss Anna Jenkins of Williamsburg, Ohio, Nov. 20, 1906.—J. W. Pletcher, a dentist of Pacific, Mo., was married to Miss Blanche Close of the same place, Dec. 5, 1906.—Clark Harrison Otis, a dentist of Danielson, Conn., was married to Miss Orcilla Maud Withington of Danielson, Dec. 12, 1906.—Charles W. Rollins, a dentist of East Boston, Mass., was married to Miss Edith Goggin of Winthrop, Mass., Dec. 10, 1906, at Nashua, N. H., after an elopement.—Thomas S. Zahm, a dentist of Springfield, Ohio, was married to Miss Florence Marjorie Wilder of the same place, Dec. 20, 1906.—Charles W. Wilson, a dentist of Walla Walla, Wash., was married to Miss Lillian O'Harra of the same place, Dec. 6, 1906.—T. P. Ernest Greene of Newport, R. I., was married to Miss Jennie Patterson Eddy of Dartmouth, Mass., Dec. 6, 1906.—Elbert A. Hunter, a dentist of Russellville, Kan., was married to Miss Emma Vanpool, Dec. 25, 1906.—Frank Gore, a dentist of Sidney, Ia., was married to Miss Lillian Eaton of the same place, Dec. 25, 1906.—R. C. Lortz, a dentist of Hope, Ind., was married to Miss Nina Mullendore, Jan. 2.—Harvey Owsley, a dentist of St. Louis, Mo., was married to Miss Elizabeth W. Dallan, Jan. 2.—Frederick O. Browne, a dentist of New York, was married to Miss Edith Beall of Alton, Ill., at St. Louis, Mo., Jan. 8, after an elopement.—John Quincy Stone, a dentist of Northampton, Mass., was married to Miss Helen M. Stockbridge of Deerfield, Mass., Dec. 24, 1906.—W. M. Shaw, a dentist of Taylorville, Ohio, was married to Miss Luetta Ervin of St. Louis, Jan. 1.—C. W. Davis, a dentist of Hammond, Ind., was married to Miss Alma Harlan, Jan. 1.—Dr. H. E. Cromwell of Ridgeway, Pa., was married to Mrs. Ethel Miller at Somerset, Pa., Jan. 27.—Dr. Thomas Logan and Miss Blanche Stewart, both of Winslow, Ill., were married Jan. 9.—Dr. Joseph Mohan and Miss Lucy Kennedy, both of Pontiac, Ill., were married Jan. 15.—The announcement of the marriage of Dr. Fred W. Constein and Miss Nora E. Buffington, both of Ashland, Pa., which was celebrated at Philadelphia on March 6, 1906, has just been made.—Dr. Grant Minnick of Springfield, Ohio, was married to Miss Bessie Stevens of Xenia, Ohio, Jan. 30.—Dr. Buell Henline of Bloomington, Ill., was married to Miss Corine Marie Thorpe of the same city, Jan. 30.—Dr. M. V. Gerhart and Miss Verna Christ, both of Reading, Pa., were married Feb. 6.—George H. Hanson, a student in a dental college of Chicago, was married Feb. 7 to Miss Lillian Beckel.—Dr. John P. Gable and Miss Jessie A. Crampton of Waverly, Iowa, were married Feb. 7.—Dr. A. J. Whisnant and Miss Bertha Biggerstaff of Rutherford, Conn., were married Feb. 14.